

FACTORS INFLUENCING THE EXPORT PERFORMANCE

OF THE SCOTTISH MANUFACTURING SECTOR

OF THE OFFSHORE SUPPLIES INDUSTRY

BY

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I declare that I am the author of this work and that unless otherwise stated all the work is my own and has not been submitted in part or in full for any other degree.

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A B S T R A C T

The development of the oil and gas resources discovered on the U.K. Continental Shelf has had a significant impact on employment in Scotland. It is estimated that in Scotland 60,000 - 70,000 people are currently in oil-related employment. Approximately 20,000 of these are employed in (over 300) units manufacturing offshore-related equipment.

However, it is argued in this thesis that domestic demand for many items of offshore-related equipment will fall from around 1982 onwards as the number and size of new field developments being undertaken declines. It is further argued that if offshore-related employment is to be maintained in Scotland it is to be hoped that manufacturers of offshore-related equipment can identify and exploit opportunities in offshore markets overseas by means of exporting.

It has frequently been suggested that involvement in the development of North Sea oil fields has given indigenous firms a comparative advantage over their international competitors. However, very little is known about the nature and scale of offshore-related exporting activity being undertaken and virtually nothing about the factors which influence the aims and attainment of these firms with respect to exporting. Thus, this thesis represents the first major study of the practice of exporting in the Scottish manufacturing sector of the offshore supplies industry.

The main objective of the thesis was to undertake a detailed examination of the major factors influencing the export performance of this sector of Scottish industry. This was achieved by means of a series of in-depth, qualitative interviews with the senior executives responsible for exporting strategy in a number of offshore-related manufacturers. In addition, further research was undertaken to investigate possible future trends in the exporting activity of the surveyed firms. In order to do this it was first necessary to develop, with the aid of a survey of expert opinion, a hypothetical scenario of the global offshore market in the period to 1985. The third and final phase of

the fieldwork then consisted of returning to the original sample of offshore-related manufacturers to discuss their expected strategy (particularly with respect to exporting) in the period to 1985, given the market situation presented in the scenario.

Thus, this thesis provides not only the first in-depth study of the major factors influencing the offshore-related export performance of Scottish manufacturers, but also investigates the implications of these findings for the future of the Scottish manufacturing sector of the offshore supplies industry in the period to 1985.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

The development of the U.K.'s oil and gas resources has had a substantial impact on the U.K. economy. Firstly, oil and gas production has exerted a considerable influence on the U.K.'s balance of payments by increasing exports and replacing oil imports. During the course of 1980 a rate of production roughly equivalent to net self-sufficiency in oil was attained. Secondly, North Sea oil and gas is becoming an increasingly important source of central government revenue. In the financial year 1980/81 government revenue accruing from the U.K. Continental Shelf - in the form of royalties, petroleum revenue tax and corporation tax - totalled £3.8 billion (Department of Energy, 1981). Finally, the development of the U.K.'s oil and gas resources has had an important direct impact in terms of income and employment creation, roughly in proportion to the level of capital and operating expenditure incurred on North Sea oil and gas activity.

The latter effect has been particularly important in Scotland where unemployment is traditionally well above the national average. By mid-1978 offshore-related employment - that is, the overall impact of the offshore oil industry on employment - in Scotland was estimated at 60,000-70,000. Ignoring consumption multiplier effects and those employed in construction activity, in mid-1978 around 46,450 people were employed in Scotland in just over 1000 units either partly or wholly-involved in supplying goods and/or services to the offshore oil industry (Scottish Office, 1979b). These 1000 units constitute Scotland's "offshore supplies industry", a term which is used to describe all the firms which supply equipment and/or services for use in the exploitation of offshore oil and gas fields. These firms fall into one of three categories. Firstly, a limited number of established companies had supplied offshore-related equipment and/or services (either to the southern North Sea gas fields developed in the 1960's or to the oil industry in the Middle East and elsewhere) prior to the development in the 1970's of the oil fields discovered in the U.K. sector of the

North Sea. Secondly, a significant number of established engineering companies diversified into the supply of offshore-related equipment and/or services following the discovery of North Sea oil. Finally, many new units were established by both indigenous and foreign firms (sometimes in the form of joint-ventures) attracted by the opportunities provided by the expanding North Sea market.

However, much of the employment created by North Sea oil developments, particularly that in the manufacturing sector, is dependent upon the development of new fields and as the North Sea gradually matures as an oil province development activity must be expected to decline. Consequently, employment in offshore-related manufacturing in Scotland must be expected to fall unless the offshore-related equipment manufacturers located in Scotland can identify and exploit other offshore markets overseas. The Department of Energy's Offshore Supplies Office is clearly of the opinion that this sector does have export potential, having gone as far as to state :

"British companies have established performance records in meeting the difficult and demanding conditions of the North Sea. They have won the reputation for skill, reliability and experience to compete strongly for offshore-related orders anywhere in the world."

(Department of Energy, 1977a)

However, there is very little information available concerning the exporting activities of this sector of industry. Although the Scottish Economic Planning Department does periodically collect, analyse and publish aggregate statistics concerning exports of offshore-related equipment by manufacturing firms located in Scotland, the data is not detailed and the method of its collection - structured questionnaire - prohibits any explanation of the data pattern. Hence very little is known about the nature and scale of the exporting being undertaken by these firms and virtually nothing about the factors which influence their aims and attainment with respect to exporting.

1.2 AIMS AND METHODOLOGY OF THE STUDY

This research seeks to satisfy the need for a thorough study of the practice of exporting in the firms located in Scotland which manufacture

equipment for use by the offshore oil industry, that is, the Scottish manufacturing sector of the offshore supplies industry. A limited amount of original statistical evidence concerning the exporting performance of these firms is presented. However, the main objective of the thesis is to provide the first detailed study of the major factors which influence the export performance of these firms. The main data base of the study therefore results from a series of in-depth, qualitative interviews with the senior executives responsible for determining exporting strategy in a number of offshore-related manufacturers.

Indeed, the qualitative research methodology adopted provides this thesis with an additional element of originality. Studies of export performance in other industries have tended to use a very rigid approach utilising a structured questionnaire (be it postal or interviewer-administered) which results in interviews following predetermined lines and respondents' answers being categorised into preconceived 'slots'. However, in the course of his desk research, the researcher identified the attitude of senior management towards exporting as a potentially vital element among the complex factors influencing export performance. Therefore, it was decided that the nature of the research problem required a more flexible approach than those offered by heavily structured interviewing techniques. Indeed, the qualitative approach allowed more freedom to probe responses and hence resulted in greater depth of information and a better understanding of the real motives for behaviour than would normally have been possible with the utilisation of more structured techniques. Thus, the adoption of this novel approach provided valuable insights into management thinking with respect to exporting in the context of the Scottish manufacturing sector of the offshore supplies industry.

Having analysed the major factors influencing the export performance and export potential of this group of firms, further research was undertaken to investigate possible future trends in their exporting activity in the period to 1985. This was achieved by requesting the surveyed firms to outline their expected strategic response to a reasonable, hypothetical scenario of the global offshore market in the period 1980-85. This scenario was developed by the researcher based

on a survey of expert opinion supported, where appropriate, by information from published sources.

1.3 STRUCTURE OF THE THESIS

The first major section of the thesis examines the nature of the offshore oil and gas supplies industry, which represents the environment in which the study was carried out. This section commences with a chapter devoted to the detailed appraisal of the operations and technological requirements associated with the three main stages of offshore oil activity - namely exploration, development and production/operation. In particular, it is emphasised that the demand for many items of offshore-related equipment is closely associated with the level of development expenditure. The following chapter - chapter 3 - commences with a general outline of the market for goods and services created by North Sea oil developments and the response which British industry has made to these opportunities. It is stressed that although in the exploitation of any major oil basin there is considerable overlapping of the exploration, development and production phases of activity, as an area matures as an oil province both the relative and absolute importance of operating expenditure will rise and the level of exploration and development expenditure will fall. Moreover, as the demand for offshore-related equipment is closely associated with the level of development expenditure, offshore-related manufacturing employment in the U.K. can be expected to decline as the North Sea matures as an oil province, *ceteris paribus*. Chapter 3 also presents a detailed analysis of the major factors influencing the pattern of British industry's success and failure in its attempts to break into the domestic offshore market. (An appreciation of British industry's performance in the U.K. sector of the North Sea was necessary in order, for example, to identify problems which might be replicated in overseas markets). Finally, after commencing with a general discussion of the participation of Scottish industry in the offshore supplies market, Chapter 4 concentrates on presenting a detailed profile of the Scottish manufacturing sector of the offshore supplies industry, which constitutes the population from which the sample of respondent firms was drawn.

The second section of the thesis discusses the theoretical and method-

ological issues upon which the study is based. Chapter 5 begins with an analysis of the strategic alternatives available to offshore-related equipment manufacturers facing a declining domestic market and stresses that if offshore-related manufacturing employment is to be maintained in Scotland, it is vital that attention is focussed on exporting offshore-related technology to offshore markets overseas. The remainder of Chapter 5 and the whole of Chapter 6 are devoted to a review of literature concerning export performance in other industries, undertaken in order to identify the major factors which may influence the export performance and export potential of the Scottish manufacturing sector of the offshore supplies industry. In particular, Chapter 5 examines the factors likely to influence management's attitude to exporting (which in turn will help to determine whether the resources necessary for successful exporting are committed), while Chapter 6 analyses the association between alternative export marketing methods and exporting success.

Chapter 7 outlines the survey aims and methodology. There were, in fact, three distinct phases of interviewing. The first (and major) phase consisted of in-depth, qualitative interviews in a sample of 40 firms located in Scotland involved in manufacturing offshore-related equipment. The primary aim of these interviews was the identification of the major factors influencing the aims and performance of these firms with respect to exporting. The second phase of interviewing comprised a survey of expert opinion, which formed the basis of a reasonable, hypothetical scenario of the global offshore market in the period 1980-85. The final phase of the fieldwork consisted of a further round of in-depth interviews in the original group of 40 companies, undertaken with the objective of appraising likely future trends in the offshore-related exporting involvement of these firms in the period to 1985. The surveyed firms were asked to base their final phase responses on the scenario presented to them by the researcher.

The final section presents the fieldwork findings and conclusions. Chapter 8 contains an analysis of the limited amount of quantitative information which resulted from a short statistical questionnaire completed during the course of the first major phase of interviewing. However, the analysis and discussion of the main body of qualitative

data concerning the major factors influencing the export performance of the Scottish manufacturing sector of the offshore supplies industry is contained in Chapters 9 and 10. While the former examines the findings concerning the nature of the factors influencing managerial attitude to exporting and its effect on export performance, the latter investigates the relationship between the use of certain export marketing methods and exporting success. The scenario of the global offshore market situation (1980-85) derived by the researcher is included as Chapter 11, with the analysis of the expected strategic response of the sample to this scenario being undertaken in the following chapter, which also provides a rough assessment of expected future trends in the employment, turnover and exports of the Scottish manufacturing sector of the offshore supplies industry. Finally, Chapter 13 draws together the results of the three major phases of the fieldwork and derives general conclusions. In particular, the final chapter synthesises the findings with respect to the major factors influencing the export performance of the surveyed firms and examines the implications of these findings for the future of the offshore-related manufacturers located in Scotland.

C H A P T E R T W O

OFFSHORE OIL & GAS OPERATIONS

2.1 INTRODUCTION

The following three chapters provide the background to the offshore oil and gas supplies industry in which the study was undertaken. While Chapter 3 examines the performance of British industry in supplying the market for offshore-related equipment and services created by North Sea developments and Chapter 4 focusses attention on the participation of Scottish companies in the offshore supplies market, the purpose of the present chapter is to provide an introduction to offshore oil and gas activity, particularly the nature and costs of offshore-related technology.

Following the brief summary of the historical development of offshore oil and gas activity provided in section 2.2, sections 2.3 - 2.5 present an examination of the operations and technological requirements associated with each of the three main stages in the exploitation of an oil province - namely exploration, development and production - with particular reference to the North Sea. A glossary of technical terms used but not fully explained in the main body of this chapter is provided as Appendix 2.1.

2.2 THE HISTORY OF OFFSHORE OIL & GAS ACTIVITY

It was not until 1946 that large-scale drilling operations began from fixed platforms erected in the shallow waters of the Gulf of Mexico off Louisiana and Texas. During the 1950's discoveries were made in the Gulf of Mexico, the Persian Gulf and Lake Maracaibo, Venezuela, while in the 1960's West Africa, South-East Asia and the southern North Sea also became important offshore provinces. Nevertheless, throughout the 1960's and the 1970's offshore activity has continued at a high level in the Persian Gulf, while offshore-related investment in the Gulf of Mexico was unrivalled until the emergence of the northern North Sea as a major oil-bearing province in the early 1970's.

Interest in the southern North Sea was stimulated by the discovery of the giant onshore Groningen gas field in Holland in 1959. Exploration resulted in the discovery, from 1965 onwards, of a number of gas fields,

principally off Eastern England.

Following the first major oil discovery - the Ekofisk field in the Norwegian sector - in December 1969, attention was increasingly focussed on the central and northern waters of the North Sea, leading to further discoveries in the Ekofisk Basin and to the discovery of the Forties and Auk fields in the U.K. sector. Finally, the existence of a rich oil basin north-east of the Shetland Islands was established in 1972, and a number of major oil discoveries were subsequently made in this area, including the Brent and Ninian fields in the U.K. sector and the Statfjord field, which lies mainly in Norwegian waters. These discoveries have been actively developed and by April 1981, 15 U.K. oil fields were already on stream, while a further 11 were being developed. In addition, in the U.K. sector of the North Sea, 7 gas fields were in production.

The environmental conditions - that is, the combination of water depth, distance from shore and weather conditions - encountered in areas of offshore activity throughout the world vary considerably. Although the extremely cold operating environment of the Cook Inlet, where oil has been produced since the mid 1960's, did present significant technical problems, it can be seen from Table 2.1 (below) that the North Sea

TABLE 2.1
World Offshore Environmental Conditions

	Typical Water Depth (feet)	Typical Distance to Shore (miles)	Environmental Conditions
Gulf of Mexico	100 - 150	20 - 40	Generally calm sea & wind conditions; potential hurricanes
Persian Gulf	60 - 150	20 - 65	Generally calm sea & wind conditions
Lake Maracaibo	50	10	Generally calm sea & wind conditions
West Africa	40 - 200	10 - 20	Moderate conditions
S.E. Asia	100 - 200	15 - 20	Moderate conditions; potential hurricanes
Cook Inlet, Alaska	50 - 150	5 - 10	Moderate conditions; potential sheet ice & iceberg hazards.
Southern North Sea	65 - 140	20 - 85	Severe conditions
Central North Sea	250 - 420	115 - 170	Severe conditions
Northern North Sea	up to 600+	up to 180	Severe conditions

SOURCE : International Management & Engineering Group (1973), pp.104-110.

environment is far more severe than that of any other offshore oil/gas province which had been exploited up to that time. In fact, the North Sea provided the oil industry with an immense technological challenge, as the demanding environmental conditions produced new, highly complex operating problems to which the industry had to develop new, sophisticated technological solutions. North Sea operations have indeed stimulated technological innovation, extending the frontiers of offshore technology, but the experience of the oil industry in the North Sea has been that every saving achieved through a new technological development has been more than offset by extra cost incurred from unexpected problems. Indeed, Table 2.2 (below) shows clearly that the capital investment necessary to bring new North Sea reserves on stream is several times greater than for oil fields in, for example, the Persian Gulf. Although differing geological characteristics, statutory regulations and other factors are of some importance, environmental conditions are the major factors contributing to the variance in investment costs in offshore areas throughout the world.

TABLE 2.2
Comparative Offshore Investment Costs

Area	Investment per barrel per day (bpd) of Production (1975 prices)
	£
Persian Gulf	40 - 100
Offshore Nigeria	400
Gulf of Mexico	1000
Southern North Sea	1500
Northern North Sea	2000 - 2700

SOURCE : Schleibach, W. (1976), p.35.

2.3 OFFSHORE EXPLORATION

The exploration phase covers all activities up to and including the drilling of appraisal wells to establish the commercial viability of a field.

The vast majority of the expenditure incurred at the exploration stage

is associated with the drilling of exploration and appraisal wells, most of which is undertaken by specialist drilling contractors.

The cost of drilling a well is a function of the hire and running costs of the rig employed, which itself depends upon such factors as the location of the well and the length of time required to complete the well (which in turn is dependent upon the depth of well, the particular formations that have to be penetrated and the prevailing weather conditions). Wells in the northern North Sea have taken anything from 30 days to 8 months to complete, although the average is around 90 days (Scottish Development Department, 1978). These factors also radically affect the relative importance of the various elements which comprise total exploration costs. Consequently, the absolute cost of drilling wells varies considerably, even within a particular offshore province such as the North Sea, while detailed cost breakdowns of 'typical' North Sea exploration wells can prove misleading.¹ For this reason cost breakdowns included in the main text are general in nature and are intended to provide no more than a rough indication of the way in which expenditure is incurred.

It can be seen from Table 2.3, which provides an approximate breakdown of North Sea exploration expenditure, that drilling services - principally rig hire - account for around 50% of total exploration costs in the North Sea.

TABLE 2.3
Estimated Breakdown of North Sea Exploration Expenditure

Exploration Activity		Proportion of Total Exploration Costs (%)
Site Preparation	: Survey & interpretation	10
Drilling Services	: Hire, mobilisation and running cost of rig	50
Drilling Materials	: Casing, chemicals, mud, bits, etc.	15
Transport	: Sea and air	15
Specialised Services	: Divers, mud engineers etc.	5
Evaluation	: Logging, testing, etc.	5
TOTAL		100

SOURCE : Synthesis of estimates from a variety of published sources.

1. Two such breakdowns are included as Appendices 2.2 and 2.3.

Other important cost items include surveying services; base, supply boat and helicopter services; and specialised services such as diving. Indeed, it is obvious from Table 2.3 that expenditure incurred during the exploration phase is heavily concentrated on services, with the direct demand for manufactured goods being restricted to that for drilling materials 'consumed' in the drilling process.

2.3.1 Surveying

The first step in the exploration of a new offshore province is usually the employment of a specialist contractor to undertake a preliminary seismic survey,² the cost of which may be shared by several oil companies. Additional seismic work will later be carried out in the more promising areas in order to outline specific structures as potential drilling sites.

2.3.2 Exploration Drilling

There are three main types of rig used in exploratory drilling offshore. A jack-up rig, which currently costs in the region of £15 million to build, requires to rest its legs on the sea bed and can only be used in water of up to 300 feet in depth. Hence the rigs most commonly used in the North Sea are semi-submersibles, which are more suitable for deeper water and more severe climatic conditions, although they do cost around £45 million to construct. Semi-submersibles use pontoons submerged beneath the surface of the water to provide stability while floating, and, while anchored by chains to the seabed, can drill in water of up to 600 feet in depth. The development of dynamically-positioned semi-submersibles (which do not require to be anchored to the seabed) will, however, allow drilling to take place in water too deep for anchoring. Finally, drill ships are ship-shaped vessels capable of faster movement between drilling sites. Although some still depend upon anchors, most drill ships are dynamically-positioned, allowing them to drill in up to 6,000 feet of water. Drill ships have, however, proved insufficiently stable for all year round use in areas such as the North Sea where severe sea states are experienced.

The most conspicuous component of drilling equipment on a rig is the derrick, which is the steel framework from which the drilling string

2. See Appendix 2.1 which provides a glossary of technical terms used but not fully explained in the main body of this chapter.

is suspended. At the top of the derrick is the crown block to which is secured the hoisting equipment used for raising, lowering and controlling the weight exerted on the drilling string. The motive power is supplied by engines driving a hoisting winch known as the draw-works.

Drilling fluid/mud is forced at high pressure down through the centre of the drilling string to the bottom of the bore-hole to cool and lubricate the bit and to wash rock-cuttings back to the surface through the space between the drilling string and the bore-hole. The marine riser, which is a tube running from the seabed to the rig, excludes the sea from drilling operations and enables the drilling fluid to be returned to the rig, whereupon the rock-cuttings are removed before the fluid is re-circulated.

When the well is a few hundred feet in depth the drilling string is removed, lengths of casing - very strong, thick-walled pipe - are lowered into the well and cement forced into the space between the casing and the walls of the bore-hole and allowed to harden. This operation prevents the walls of the bore-hole caving in, prevents unwanted water seepages flooding the hole and facilitates the control of well pressures and oil/gas production. Drilling is then resumed using a bit of smaller diameter. As the hole is deepened, successively narrower strings of casing are added, each new string passing through the string previously introduced. In order to reduce the chance of a 'blow-out', that is, a sudden escape of oil/gas from a well during drilling, a blow-out preventer stack (BOP) is fitted to the top of the casing as soon as the first string of casing has been run.

While drilling is in progress the geologist can learn about the nature of the rocks being penetrated by checking the drill-cuttings brought to the surface and by taking readings or 'logs' by means of instruments introduced into the bore-hole. If necessary a hollow bit will be used to obtain a 'core' of rock for laboratory testing. When a potentially oil-bearing formation is reached it is tested under conditions simulating as closely as possible those that would exist if the well were put on commercial production. Assuming the test proves favourable the well will be completed with the insertion of the final string of casing which must, however, be 'perforated' (by

means of a 'gun' lowered into the bore-hole) to allow the oil/gas to flow into the well. At this point the BOP is closed and the well shut in as a producer awaiting development. A well which proves uncommercial must also be sealed off - generally by inserting a plug of cement - to ensure that no escape of any kind can occur.

2.3.3 Appraisal and Evaluation

Should oil/gas be discovered in what appears might be commercial quantities, further drilling by a mobile rig will be required to delineate the field. The number of appraisal wells required will largely depend upon the geological complexity of the hydrocarbon bearing structure found.

Appraisal drilling will be followed by a feasibility study, which is a technical and economic evaluation of the commercial viability of a proposed field development, involving the selection of the major elements of a field development plan and a decision as to whether the expenditure necessary to develop the field is justified on economic grounds.

2.4 OFFSHORE DEVELOPMENT

The development of an offshore oil/gas field generally requires :-

- (a) construction and installation of a production facility
- (b) manufacture and installation of production equipment
- (c) drilling of production and water/gas injection wells
- (d) installation of facilities enabling the transportation of the oil/gas to an onshore terminal
- (e) construction of an onshore terminal.

Table 2.4 indicates the areas in which money has been and will be spent in bringing North Sea fields into production. It summarises the estimated capital expenditure on both U.K. and Norwegian projects in the central and northern North Sea on which development commenced between 1971 and December 1979 and includes all expenditure on the development of these fields from the time at which they were declared commercial.³

3. Hence exploration and appraisal drilling costs and platform operating and maintenance costs are not included.

TABLE 2.4

Estimated Breakdown of Capital Expenditure on Oil/Gas Fields
in the Central/Northern North Sea

Cost Item	Proportion of Total Development Costs (%)
Platform structures	14
Platform equipment	27
Platform installation	10
Development drilling	19
Loading buoys	1
Pipelines	12
Terminals	10
Miscellaneous	7
TOTAL	100

SOURCE : Wood, Mackenzie & Co. (December 1979)

It can be seen that roughly 50% of estimated total capital expenditure is accounted for by the installation cost of the production platforms and their equipment. Development drilling is the next most important item, accounting for 19% of capital expenditure, while oil transportation facilities - namely pipelines (12%) and loading buoys (1%) - together account for a further 13%. The miscellaneous factor includes such items as land purchases and consultancy fees. It should, however, be noted that this pattern of expenditure may change over time. For example, while virtually all North Sea fields to be developed in the foreseeable future will require platforms and associated equipment, the demand for major new pipelines may diminish as future developments are linked to the existing trunk lines.

2.4.1 Production Facilities

A production platform consists of two main components : the 'jacket' which rests on the seabed and the steel deck which it supports (and upon which the production equipment is installed).

The majority of the platforms installed in the North Sea are conventional steel jackets of the type originally developed over twenty years ago for use in the Gulf of Mexico. However, the deeper water and severe climate of the North Sea presented new design problems which were resolved basically by increasing the size and weight of the jackets installed. Consequently North Sea platforms are immense structures, far larger (and hence far more expensive) than those used previously in the Gulf of Mexico and the southern North Sea.

The first concrete gravity structure was ordered in 1973 at a time when this new approach appeared to offer the opportunity of reducing platform construction costs. This type of platform will rest on the seabed by virtue of its own weight and thus requires no piling, that is, fixing to the seabed by means of large stakes driven into the ocean floor. In addition, concrete platforms are delivered to the field virtually complete, with the deck and most of their equipment already installed, whereas only the 'jacket' of the steel platform is initially delivered to the field, leaving the deck and equipment to be lifted and installed offshore in the difficult environment of the North Sea. Finally, the base of the concrete platform can be used to store oil production.

However, apart from a brief period (1973-74) when several concrete structures were ordered for the U.K. sector of the North Sea, steel structures have remained more popular. Steel platforms currently appear to have several important advantages, not least of which is their relative cheapness compared with concrete structures. Welding techniques have also improved considerably, while steel is more suitable for analysis than reinforced concrete, an important consideration when platforms are being installed in increasingly demanding offshore environments. Moreover, oil companies claim that concrete structures have taken too long to build. Finally, improved offshore heavy lifting equipment and developments in piling techniques have reduced the installation period offshore, a vital factor in an area with a limited 'weather window'.

The concrete platform builders reacted by developing new designs of lighter concrete gravity platforms with comparatively slim gravity towers - the so-called 'telescopic column' - but these have so far failed to win orders. The oil companies are, however, currently eval-

uating a variety of designs of steel-concrete hybrids, which consist basically of a steel substructure on a concrete base resting on the seabed.

The cost of a fixed platform (whether steel or concrete) increases exponentially with increases in the depth of water and thus there is a strong economic incentive to find alternative ways to develop fields situated in deep water. Many new design concepts based largely on the tethered buoyant principle - the 'floating platform' - have been developed, and these seem to offer considerable advantages over the more conventional types of structure, not only in cost (since the cost of fabricating a floating platform is much less dependent on water depth) but also in construction time and availability of construction sites. Also, unlike a fixed production platform, the floating platform is mobile and could be floated from a depleted field to a new one, greatly extending the life of the platform.

As yet, for a variety of reasons,⁴ oil companies have been unwilling to risk using one of these new platform designs. However, it seems that a major breakthrough will be achieved in 1981/82 when Conoco are expected to place the first order for a tension-leg platform (TLP) for use on their Hutton field. The floating structure will be fixed to the seabed by vertical tubular steel mooring lines attached to massive anchors. Large buoyancy columns on the platform provide an excess of buoyancy which is greater than the platform weight and thus keep the mooring lines in tension for all weather. Tensioned like this virtually all vertical motion is eliminated, although lateral motions will occur.

However, floating systems also provide a competitive alternative to conventional fixed platforms in smaller developments in shallower waters. Indeed, the first floating production system used in the North Sea was a converted semi-submersible drilling rig installed on the small Argyll field (which would probably have been uneconomical to develop using a conventional platform) and a similar development has been used on the Buchan field. BP have developed a single well oil production system (SWOPS) which will employ a converted tanker to both produce and transport offshore oil from a single subsea well. This

4. See Lewis et al, 1978a, pp. 18-19.

system, which would produce oil at up to 20,000 b/d, would cost around £25-50 million for tanker conversion and subsea well installation. In addition, off the east coast of Spain Shell have installed a single anchor leg production system (SALS) in combination with sub sea completions. The leg is connected to a universal joint on the sea bed and a swivel system (incorporating a mooring frame and floatation tank) on the surface, to which is permanently moored a tanker which is equipped with oil and gas separation equipment and storage facilities. Oil is then loaded into 'shuttle' tankers which fill up alongside and carry the oil ashore.

In the North Sea (and other high cost areas) larger fields may also be initially developed using a system incorporating subsea completions and a floating unit, usually a semi-submersible drilling rig. That is, subsea completions may be used to produce oil from appraisal wells before the exact plan for the development of a field has been finalised. This approach permits the acquisition of more detailed information about the reservoir's characteristics, as well as providing an early positive cash flow while awaiting the construction of a conventional platform. Undertaking offshore drilling concurrently with onshore construction is now becoming the norm, with a growing number of operators drilling development wells through templates - steel frames placed on the seabed - before the platform is installed in order to advance production, although as yet these wells have been closed on completion of drilling and production held back until after the installation of the production platform.

Subsea completions may also allow the commercial development of those parts of a field which cannot be reached from a central fixed platform but which are not large enough to justify the installation of a second platform. Small accumulations may call for a single well completion linked to the platform by an individual flowline, while more complex accumulations requiring several satellite wells some distance from the platform will involve the use of an underwater manifold serving as a collection point for the oil from the individual wells which is then fed into a single line linking the manifold to the platform. Subsea completion is, however, an expensive technique and the costs of drilling and connecting each underwater completion to a production platform can be up to ten times the cost of a conventional well

(Shell Briefing Service, 1979d).

There are two basic types of subsea installations, the 'wet' completion and the 'dry' completion. In the case of the 'dry' or one atmosphere subsea completion the vital components are encapsulated in a thick-walled, pressurised compartment which allows maintenance to be carried out in a one atmosphere 'shirt-sleeve' environment by operators lowered to the seabed in one atmosphere chambers which lock onto the wellhead compartment. Problems have been experienced with a system of this type (developed by Lockheed) which has been installed in the Garoupa field, offshore Brazil. The 'wet' completion has its components exposed to the water under ambient pressure. Maintenance by divers is possible in shallow water but in deeper water this system would be remote-controlled. At the moment only the basic production unit - the wellhead 'Christmas Tree' - is placed on the seabed, but the next step will be to locate the processing equipment on the ocean floor and hence eliminate the need for a surface installation.

2.4.2 Installation

Concrete platforms are towed out vertically with their steel deck and much of their equipment in their completed form. When on location, the base is ballasted and the platform sunk into position on the seabed. In contrast, conventional steel jackets travel horizontally supported by special tanks which make them self-floating. On arrival, controlled flooding of these tanks lowers the structure to its predetermined position on the seabed. A temporary deck can then be installed to allow the steel piles, which fix the structure to the ocean floor, to be driven home. Thereafter the steel deck, living quarters and deck modules are installed with the aid of at least one large derrick barge before finally the mechanical and electrical hook-up can take place. The whole installation operation may take 4 - 6 months to complete.

Derrick barges have evolved into large, complex and costly semi-submersible units, consisting basically of a pontoon upon which is mounted several cranes of varying capabilities of up to 3,000 tons.

The hire of the derrick barge is by far the largest single installation cost item, accounting for approximately 45-50% of total installation cost.⁵ Transportation - tug and supply boat services -

5. See Appendix 2.4

accounts for a further 20% of total installation costs, with mechanical and electrical hook-up another 15-20% and diving services 5-10% of total installation cost. Thus, although there is a demand for steel piling and other consumables, services account for the vast majority of expenditure on installation activities.

2.4.3 Platform Equipment

Costs will be minimised by locating onshore as much of the equipment as possible. Thus, on a field close to shore the platform may consist of a single deck, drilling equipment and production/process plant, with accommodation, power plant and other facilities being located onshore. However, the discovery of oil in deep water some distance from shore - as in the North Sea - created a demand for more complex, self-supporting structures (since they might be cut off for several days due to adverse weather conditions). Nevertheless, even on platforms in the North Sea the equipment installed will vary considerably depending upon, for example, the number of producing wells, the quantities of gas being produced and whether the gas is being flared, transmitted by pipeline or reinjected for pressure maintenance purposes. Detailed lists or cost breakdowns of equipment for a 'typical North Sea platform' should therefore be treated with some caution.

Table 2.5 presents a breakdown of the estimated demand for platform equipment associated with field developments under way in the U.K. and Norwegian sectors of the central and northern North Sea as at December 1979.⁶ Being based on cost data provided by the oil companies it is not surprising that drilling equipment is totally excluded from the analysis, as development drilling is normally carried out by a drilling contractor who usually supplies his own drilling equipment.

A platform's power, process and other equipment is housed in 6-8 modules - essentially large steel boxes - which are prefabricated onshore and loaded onto the platform as complete self-contained equipment packages (weighing up to 2,600 tons each), thereby minimising the amount of fabrication which must be undertaken offshore.

6. This cost breakdown is virtually identical to that put forward by Lovegrove (1975, p.52), while a very similar cost breakdown can be produced by appropriate re-organisation and aggregation of cost data provided by Shell and reproduced by Crook (1975) - See Appendix 2.5.

TABLE 2.5

Estimated Breakdown of the Demand for Platform Equipment
for Oil/Gas Fields in the Central/Northern North Sea

Items of Equipment	Proportion of Total Platform Equipment Costs (%)
Deck module shells	10
Living quarters and helideck	19
Boilers, heating, ventilating and burner equipment	1
Water & sewage treatment plant, tanks & mixing equipment	3
Miscellaneous fittings	7
Separators	4
Pumps & compressors	6
Wellhead & hydraulic shut-down equipment	5
Electrical	36
Communications, navigational, fire-fighting & safety equipment	6
Hoisting equipment (including cranes)	3
TOTAL	100

SOURCE : Wood, Mackenzie & Co. (December, 1979).

The living quarters, which will provide accommodation for up to 200 men and will include recreation and catering areas, may also be in modular form. Together with the helideck, these fairly basic structural steel items may account for around 30% of total platform equipment costs.

Approximately 5% of total platform equipment cost is incurred on wellhead and hydraulic shutdown equipment - essentially the wellhead 'Christmas Tree', which is an assembly of valves and fittings which is located at the head of a well to control the flow of oil/gas. All oil contains a certain amount of gas which expands when it gets to surface atmospheric pressure. Therefore, if the oil is to be off-loaded into tankers the oil must be 'stabilised', that is, the gas removed. If there is a

considerable volume of gas to be processed a large, expensive treatment plant will be required on the platform. However, even if the oil is to be transported by pipeline, gas/oil separators will be installed on the platform to remove some of the gas for use with gas turbines which act as prime movers for power generation. The 'process plant' (which may account for around 5% of total equipment costs and will consist of separators, scrubbers, filters, valves, pipework, etc) is usually designed and assembled as a package which is installed in modular form.

Once treated, the oil will be pumped to an offshore loading buoy or along a pipeline. In fact, a multitude of different types of pumps are used offshore, ranging from the mainline oil pumps (which pump the oil ashore) to small pumping sets for lubricating oil, fuel oil etc. Others include the somewhat specialised mud and cementing pumps used in the drilling process and those used in the fire-fighting, sewage treatment, production processing and injection systems. Water and/or gas may be pumped into the reservoir to artificially bolster the pressure and improve recovery. In the case of water injection, water is pumped from the sea, through processing and (at high pressure) into the well, while gas will be compressed before injection into the well. Table 2.5 suggests that, on average, pumps and compressors may account for around 6% of platform equipment costs.

The majority of the expenditure incurred on electrical equipment (which altogether represents over one-third of total equipment costs) is accounted for by the power plant - expenditure on cable, instrumentation, meters and gauges totals only about 3% of equipment costs (Crook, 1975). The power plant, which is normally housed in a single module, usually comprises of gas turbine driven generators, switchgear, distribution transformers, motor control gear and other ancillary equipment. The design of the power plant will depend upon the total power requirements of the platform in the production phase. The largest power requirements will normally be associated with the pumping of oil ashore via a pipeline. However, if the oil is to be off-loaded into tankers the largest drives will be motors driving water or gas injection pumps, with smaller drives for process plant (compressors etc.) and some assessment also made for the domestic loads for heating and lighting the living quarters, offices, and so on. Power is also required to drive the fire-fighting equipment.

Due to the extreme importance of this plant a separate generator set (usually diesel) and switchboard will be provided away from the power module. A diesel generator may also be installed as a back-up power generation unit.

The major communications links required for offshore operations typically include open-voice communication between platforms/rigs, supply ships and shore; radio beam navigational aids; and transmission of data from the computer installed on the platform to monitor oil/gas production to the terminal onshore. On the platform itself an internal telephone system, public address system and portable radio equipment are also required, along with TV and other entertainment systems.

All maritime communications are based on radio and for communication between ships and platforms the traditional methods are employed. However, the amount of information which must be transmitted between platform and shore threatened problems of radio frequency congestion. Consequently, the Post Office, in conjunction with Marconi Communications Systems, have spent several years and £7 million developing a system known as trans-horizon microwave radio. Microwaves have extremely high frequency and so can carry very large amounts of information - by telex or telemetry (a means of transmitting information in digital packages) - as well as many individual telephone channels linked directly into the public telephone network. Microwave signals only travel in straight lines and hence under normal conditions their range is restricted by the earth's curvature. However, the Marconi system solves this problem by utilising the principle of tropospheric scatter, whereby high frequency signals are 'bounced' off the troposphere and down to receivers perhaps 200 miles away.

Finally, approximately 3% of platform equipment costs is expended upon the pedestal cranes, hoists, winches and other handling equipment employed on a platform, while included in the 7% of total equipment cost shown in Table 2.5 to be incurred on 'miscellaneous fittings' is fairly significant expenditure on valves (3%) and pipe/tubing (2%).

2.4.4 Development Drilling

Modern drilling techniques, which allow deviations of up to 60% to be reached, may make it possible for a large reservoir to be drained in an

optimal way from a single structure, thereby minimising platform fabrication costs. Hence, as many as thirty development wells may be drilled from a single platform on a large field such as Forties or Brent, normally by a specialist drilling contractor.

It can be seen from Table 2.4 (above) that development drilling accounts for approximately 19% of total capital expenditure in the northern North Sea. The IMEG report (1973, p.28) estimated that roughly 40% of development drilling expenditure is spent on drilling services, 20% on supply boat and helicopter services and 25% on specialised services such as cementing, well logging and mud control, with insurance and other items accounting for the remainder.

2.4.5 Transportation Facilities

Oil can be brought ashore by a pipeline laid from the field to an onshore receiving terminal or by tankers which fill up at sea from an offshore loading facility. The choice of method depends largely on economics - field size, production rate, distance to shore etc. - although other criteria, such as pollution risk, are also considered. An offshore loading system usually has a lower capital investment but higher operating costs than a pipeline and in general is more suitable for small or isolated fields, where the expense of a pipeline is not justified.

In the North Sea offshore loading systems of the single buoy mooring (SBM) type have been installed not only on some of the smaller fields - such as Auk, Argyll and Montrose - but also on larger fields, such as Brent, in order to allow production prior to the completion of a pipeline. In the case of the single point mooring (SPM) employed on the Argyll field, the tanker is moored by bow hawsers to a single rotatable mooring point around which it is allowed to swing in order to present the least resistance to the prevailing weather conditions. For the Auk field Shell developed the exposed location SBM (or ELSBM), which is a large SBM especially designed for exposed locations, incorporating a helideck and temporary quarters to facilitate access and repair work. However, all SBM's are sensitive to bad weather conditions, resulting in considerable downtime, and unlike the Auk field the Brent field's reservoir characteristics are such that an interruption of production was impossible. For this reason the SPAR semi-submersible oil storage and loading terminal was developed. By combining a storage unit (for

300,000 barrels of oil) with a mooring buoy production does not have to cease when weather conditions prevent loading.

However, in 1978 over 80% of the oil production from the U.K. sector was transported by the 700 miles of submarine pipeline in use at that time (Department of Energy, 1979). Four major oil pipelines - ranging from 93-120 miles in length and 30-36" in diameter - have been laid for U.K. oil fields, while the Norwegian Ekofisk field is also connected to Teeside by a major 220 mile pipeline. In addition, several shorter pipelines, often of smaller diameter, have been constructed to feed the output of adjacent fields into these trunk lines.

As natural gas liquefaction is neither commercially nor technically feasible in the North Sea, large gas accumulations will be served by a pipeline to shore. By the end of 1978 over 850 miles of submarine gas pipeline was in operation in the North Sea, including 3 major lines to the St. Fergus terminal - from the Frigg(2) and Brent fields - and several feeder lines in the northern sector, and the complex of shorter pipelines linking the southern North Sea gas fields with the mainland.

The total cost of a pipeline can be subdivided into material costs and installation costs, with the latter being the dominant factor. For example, 85% of the cost of the Forties pipeline was spent on construction effort (Select Committee on Science and Technology, 1974). Material costs will depend upon the pipe's diameter, the grade of steel used and the coating applied - submarine pipeline is usually provided with a concrete coating to give it additional weight and prevent corrosion and damage from ships' anchors etc. Pipe-laying is a very complex, precision operation which is therefore particularly expensive in the deep, stormy North Sea, for which a new generation of very expensive, sophisticated pipe-laying and pipe-burying vessels has been designed. The sections of coated pipe are welded onboard the lay barge and then conducted over the stern of the vessel via the 'stinger', or ramp, which keeps it at the correct angle and tension and so prevents buckling as the now continuous length of pipe enters the sea. Once laid, the pipeline is inspected before being buried by a special trenching machine operated by remote-control from a bury barge on the surface.

2.4.6 Terminals

Expenditure on onshore terminals represents approximately 10% of total capital expenditure to date on development in the northern North Sea. Oil and gas terminals vary considerably in size and function depending, for example, upon the fields to which they are linked and the nature of the hydrocarbons received.

The terminals receiving North Sea oil are at Sullom Voe in the Shetland Islands; Flotta in the Orkney Islands; Seal Sands, Teeside; and Grangemouth, which is linked by overland pipeline to Cruden Bay. North Sea terminals are invariably involved in carrying out the stabilising process, that is, the removal of the more volatile gases present in the crude in order to enable it to be shipped by tankers to refineries. Facilities at an oil terminal may therefore include oil and gas storage, water and gas separation, gas liquefaction, loading jetty or SBM, ballast water treatment and power station.

The only gas terminal serving the northern North Sea, situated at St. Fergus, has facilities for the receipt and metering of the gas and the separation of natural gas liquids (or condensate) from the dry gas prior to the latter being transferred into the national grid.

2.5 OFFSHORE PRODUCTION

A particular field's operating/production costs will depend largely upon its size and reservoir characteristics, the length of time it has been producing, the operating procedures and standards of its operator and its distance from the nearest supply base.

Table 2.6 (below) provides a detailed breakdown of the estimated operating costs of the 26 oil and gas fields situated in the U.K. and Norwegian sectors of the central and northern North Sea either in production (14) or under development (12) as at December 1979. However, it should be noted that this table provides only a 'snapshot' picture of the nature of North Sea operating costs, which may change significantly over time. Indeed, it is only 6 years since the first U.K. North Sea oil field came onstream and operators are only now beginning to amass sufficient experience of operating platforms in the harsh environment of the North Sea to allow estimates of operating expenditures to be made.

TABLE 2.6

Estimated Breakdown of Annual Operating Costs for the
Oil/Gas Fields in the Central/Northern North Sea (1979)

Cost Items	% of Total
Platform Operating Costs :	
Supplies	5
Hydrocarbon treatment	6
Communications	2
Safety	1
Miscellaneous	1
Platform Maintenance Costs :	
Remedial operations on equipment	5
Structural inspection & maintenance	6
Servicing the wells	6
Transport Costs :	20
Administration & Miscellaneous Costs :	
Office expenses	1
Miscellaneous communications	1
Labour costs	2
Contingency	1
Oil & Gas Disposal Costs :	
Pipeline	5
Tankers	6
SBM/terminal/harbour	6
Insurance Costs :	
Platforms	21
Pipelines/terminals/other	5
TOTAL	100

SOURCE : Wood, Mackenzie & Co. (December, 1979)

Virtually all operating expenditure is incurred on services, with the major cost items being transport; insurance; and inspection, maintenance and repair (IMR). The Department of Energy has estimated that in the early 1980's around 50% of the expenditure on IMR will be associated with well workovers, that is, the periodic cleaning of wells and the replacement of downhole valves and other equipment (which, incidentally, requires the continuing presence of drilling equipment on the platform to enable re-entry into the wells).

2.6 CONCLUSION

It is clear from the above discussion of the nature of offshore oil/gas operations that the technological demands associated with the three main phases of activity - namely exploration, development and production - are quite different. Although platform installation and development drilling services represent major cost items, the majority of development expenditure is associated with the purchase of hardware such as platforms and their electrical, process, wellhead and other equipment; pipelines; offshore loading systems etc. In contrast, expenditure at the exploration and production phases of activity is very heavily concentrated on services. In fact, although there is a derived demand for drilling rigs, supply boats, helicopters etc., direct demand for manufactured goods is restricted to 'consumables', such as drilling tools and supplies. The principle consumable cost item used in the drilling process is steel casing, several hundred tons of which can be built into a well whether it is successful or not, although expenditure on cement, drilling mud, chemicals, components of the drilling string etc. is also significant. (Normally the oil companies purchase and supply drilling contractors with the major value items such as casing and other down-hole equipment, leaving the drilling contractors to obtain the other operating and maintenance supplies for the rig itself). Thus, most manufacturers of offshore-related equipment are heavily dependent upon development activity continuing at a high level.

Having provided an introduction to the form of offshore oil/gas activity and, in particular, outlined the nature and costs of offshore-related technology, the following chapter investigates the performance of British industry in meeting the demands for equipment and services created by North Sea oil/gas developments.

C H A P T E R T H R E E

THE U.K. OFFSHORE SUPPLIES INDUSTRY

3.1 INTRODUCTION

The previous chapter outlined the nature of offshore oil/gas operations. Rough cost breakdowns were used to examine the differing technological demands created at successive phases of offshore activity and, in particular, to emphasise the fact that the demand for most items of offshore-related equipment is associated with the level of development activity being undertaken.

The following two sections of this chapter discuss, in general terms, the market for goods and services which offshore activity in the U.K. sector of the North Sea has created and the response which U.K. companies have made to these opportunities. In these sections copious use is made of data collected by the Department of Energy concerning the level of orders and expenditure incurred on oil/gas activities in the U.K. sector of the North Sea. While section 3.2 analyses the trend in U.K. offshore expenditure (stressing the fact that development expenditure will eventually decline in real terms as the North Sea matures as an oil province), section 3.3 examines the performance of U.K. industry in general in supplying the needs of the offshore oil/gas industry. There then follows, in section 3.4, a more detailed discussion of the major technological, marketing and financial factors which have influenced the pattern of U.K. involvement in the U.K. offshore market, this analysis of the experience of U.K. companies attempting to break into their domestic market being necessary in order to gain an impression of the problems that might be faced in world markets.

3.2 U.K. OFFSHORE EXPENDITURE

In 1980 total oil production from the U.K. sector of the North Sea was 80.5 million tonnes (1.6 million barrels per day), while gas production amounted to 37.3 billion cubic metres (102 million cubic metres per day). The cost of winning these resources has been immense. Total expenditure incurred by operators and other production licensees engaged in the exploitation of the U.K.'s oil and gas resources has

TABLE 3.1
Expenditure on the U.K. Continental Shelf 1976-80¹

	1976		1977		1978		1979		1980	
	£m	%	£m	%	£m	%	£m	%	£m	%
Exploration costs ²	301.4	13	374.8	15	261.2	10	240.8	9	375.1	11
Development costs	1880.6	81	1899.9	77	1992.2	77	2043.9	73	2378.2	69
Operating costs	129.8	6	206.6	8	345.9	13	501.8	18	692.4	20
TOTAL	2311.8	100	2481.3	100	2599.3	100	2786.5	100	3445.7	100

SOURCE : Department of Energy (1981), Appendix 11, pp 45-46.

1. This table summarises the data shown in Appendices 3.1 and 3.2.
2. Expenditure on appraisal drilling is regarded as a development activity in these official statistics, contrary to the definition provided in Chapter 2, which included appraisal drilling in the exploration phase. This makes little difference, however, either to Table 3.1 or the conclusions drawn from it, as expenditure on appraisal drilling is a relatively minor cost item (see Appendix 3.2).

risen dramatically from around £360 million in 1973 to approximately £830 million in 1974 and roughly £1500 million in 1975 (Department of Energy, 1977c). Table 3.1 (above) indicates that this upward trend has continued in the period 1976-80, with total expenditure on the U.K. Continental Shelf approaching £3,500 million in 1980.

Table 3.1 shows that over two-thirds of total expenditure on the U.K. Continental Shelf in each of these five years was associated with the development phase of activity. However this table provides only a 'snapshot' picture of the situation over a relatively short time and significant changes may take place in future years. For example, although many factors influence the pace of offshore exploration in an offshore province, it is to be expected, *ceteris paribus*, that as an offshore province matures exploration and appraisal drilling will decline. Indeed, although there was a slight upturn in the number of exploration and appraisal wells drilled in 1980, drilling activity was still considerably below the level achieved in the period 1973-78.³ As drilling activity falls it is to be expected that exploration expenditure will also fall in both absolute and relative terms (although total exploration expenditure will also be influenced by changes in drilling hire rates).⁴ Similarly, a fall in exploration drilling must be expected to be reflected in a reduction in the number of significant finds available for development, and thus, in time, development expenditure will also fall as an offshore province matures. Finally, the increase in operating costs identified in Table 3.1 will continue, in both absolute and relative terms, as the number of fields developed and brought onstream increases.

Thus, although in the exploitation of North Sea oil and gas resources there will be considerable overlapping of the exploration, development and production phases of activity, the balance of activities will change over time with the relative importance of operating expenditures rising as the level of exploration and development activity falls.

3.3 THE U.K. OFFSHORE MARKET : OPPORTUNITY AND RESPONSE

The firms which constitute the U.K. offshore supplies industry are not always easily identifiable. In fact, it could be argued that there is no such thing as the offshore supplies industry as such, so diverse are

3. See Appendix 3.3.

4. It should be noted that the pattern of exploration expenditure in the period 1976-80, shown in Table 3.1, closely reflects the trend in drilling activity identified in Appendix 3.3.

the demands of the offshore oil industry. This was highlighted in 1974 when the Department of Energy's Offshore Supplies Office (OSO), in the course of trying to minimise the effect of the three-day week on offshore activity, identified around 2,000 firms involved in the offshore market, many of which had no idea their products were being used offshore. Similarly, in 1978 a study by Baker et al found that the U.K. offshore supplies industry consisted of over 2,000 firms supplying over 150 main products and services.

According to Baker et al (1978), when activity began in the southern North Sea gasfields, in the mid-1960's, U.K. engineering companies secured no more than 10% of the market. However, a study carried out in 1972 by the International Management and Engineering Group (IMEG) found that U.K. owned companies were winning approximately 25-30% of the U.K. offshore market. IMEG (1973) forecasted that as a result of the advantages of proximity to the market and the accumulation of offshore experience, the U.K. share would reach 35-40% by the late 1970's. Moreover, IMEG believed that if the recommendations contained in its report were fully implemented it was possible that the U.K. share could reach 70% by the end of the decade.

The best source of information on the involvement of U.K. firms in the U.K. offshore supplies market is the analysis provided by the OSO of the value and U.K. content of orders placed by the operators of oil and gas fields on the U.K. Continental Shelf.⁵ Although the OSO define 'U.K. share' somewhat differently from IMEG,⁶ it is nevertheless quite clear from Table 3.2 (below) that the market share secured by the U.K. offshore supplies industry has significantly increased in the course of the 1970's.⁷ A more detailed analysis of orders placed by industrial sector in the period 1974-76 and 1977-80 is provided in Appendices 3.4 and 3.5

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5. This analysis is based upon quarterly returns made individually by the operators to the OSO.
 6. The OSO defined 'U.K. share' as the value of the contracts and main sub-contracts placed with companies which through employment, manufacturing or sub-contracting make a substantial contribution to the U.K. economy. A distinction is drawn between these companies and 'brass-plate' companies whose function is to import finished goods or services.
 7. The reduction in the U.K. share of orders placed in 1980 can be partly explained by the changes in the composition of the orders placed that year, in particular to the placing of fewer production platform orders than in 1979.

TABLE 3.2

Orders Placed for the U.K. Continental Shelf 1974-80

Year	Value of Orders Placed ⁸ (£m)	U.K. Share (%)
1974	1279	40
1975	1185	52
1976	1041	57
1977	1295	62
1978	1574	66
1979	2679	79
1980	2380	71

respectively. These show that the U.K. share of virtually every supply sector has improved over the period 1974-80, implying that the overall improvement in the performance of the U.K. offshore supplies industry highlighted in Table 3.2 reflects improvements in supply capability rather than changes in the pattern of demand. This performance has been described in some quarters - especially the Department of Energy itself - as a striking success. Eglin (1977) emphasised this point by forecasting that by 1980 the U.K. would be the world's tenth largest oil producer yet would have the second largest offshore supplies industry, seemingly overlooking the fact that with the exception of the U.S.A. and U.S.S.R. the other major oil producing nations are among those normally described as "less developed". However, the more detailed analysis of the performance of the U.K. industry in the offshore market which follows indicates that the U.K. share of individual market sectors varies enormously, with U.K. capability in certain sectors, such as exploration drilling, still almost totally lacking.

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8. This data is not directly comparable with the expenditure statistics provided in the previous section for the following reasons:-
- the expenditure that results from an order is often spread over a number of years.
 - offshore operators' expenditure on their own personnel and administration is included in expenditure but not in the value of orders placed.
 - actual expenditure resulting from orders is subject to inflation and variations, but the value of orders recorded is not always adjusted.

3.4 MAJOR FACTORS INFLUENCING THE PATTERN OF U.K. INVOLVEMENT IN THE U.K. OFFSHORE MARKET

3.4.1 Technological Barriers to Entry

It is a popular misconception that offshore activities are 'high technology'. In fact, only a few offshore activities (mainly in the service sector) are 'high technology', and the 'average' technological content of offshore activities as a whole is not especially high (Lewis & McNicoll, 1978). On the contrary, many of the demands created by offshore operations are well within the capability of the U.K. engineering industry (Scottish Development Department, 1978; Lewis & McNicoll, 1978). For example, in 1974 Gibson estimated that around 60% of the total development costs of a field (whether in the North Sea or elsewhere) could be expected to be spent on equipment purchased from traditional civil and mechanical engineering industries.

Furthermore, in some areas where U.K. companies did lack offshore expertise they have been able to acquire it through joint-ventures or licensing agreements, often with the encouragement and advice of the OSO. In 1975, 20% of the Scottish manufacturing firms involved in oil (and 40% of the service firms) were in partnership with foreign companies (Pounce et al, 1976).

Nevertheless, especially in the early 1970's, many U.K. companies thought that the supply of oil equipment and services was high technology and that therefore, unlike U.S. companies, they did not possess the skills and knowhow to meet offshore demands. (Confusion may have arisen because the additions to offshore technology resulting from North Sea experience have tended to be of an advanced nature and it is these high technology developments which have attracted most attention in the press etc.) Furthermore, although requiring fairly standard skills and production techniques many items of equipment were unfamiliar in function, and because of their lack of knowledge of the terms and the technology used in this 'new' industry⁹ some companies experienced difficulty in identifying areas where their skills could be applied (Lewis et al, 1978a; Moar, 1980).

9. It should, however, be remembered that offshore development in the southern North Sea had been underway since the mid-1960's.

3.4.2 Purchasing Inertia and Other Industrial Marketing Problems

The apparent inability of U.K. companies to identify the exact nature of the oil industry's needs and appraise which of these they were best qualified to satisfy has been a major factor in their failure to win a larger share of the U.K. market, particularly in the early 1970's (Gibson, 1974; Scottish Office, 1977a). Indeed, many prospective suppliers appeared to want the oil companies to inform them of the opportunities available and how they might go about seizing them, rather than undertake market research themselves, despite the fact that they could have learned much from the considerable body of literature pertaining to the North Sea which soon became available (Daniels, 1976; Larminie, 1976). Although the OSO aims to help U.K. industry identify the needs of the offshore operators, and trade associations such as the Association of British Oceanic Industries (ABOI) and the Council of British Manufacturers and Contractors serving the Petroleum and Process Industries (CBMPE) collect and disseminate marketing information to their members, the onus must rest on the supply firms themselves to seek out market opportunities which, on the basis of their own commercial judgement, they feel they can profitably exploit (Scottish Office; Lewis et al, 1978a; Daniels, 1976).

Similarly, both Baker et al (1978) and Lewis et al (1978a) found that a number of prospective suppliers experienced difficulty in identifying the location of purchasing authority within the oil companies. A number of studies undertaken in other industries have shown that several individuals or functional areas (such as purchasing, sales, production, the board of directors etc.) are generally involved in an industrial purchasing decision and that these influencers are not all necessarily interested in the same characteristics of the prospective seller's product (Weigand, 1968; Webster, 1965; Strauss, 1962; Kellogg, 1970). A supplier will thus find itself selling to a multi-individual customer, while there are also many possible outside influencers, such as consultant engineers, governmental bodies, etc. (Weigand, 1968; Hill, 1973). Moreover, buying responsibility will depend upon certain characteristics of the product, such as its importance (either in terms of money or how critical its purchase is to the total operation) or its technical complexity; the personal characteristics of the decision-makers; organisational variables, such as the size of the firm; and the novelty of the purchase (Fisk, 1967; Desoutter, 1973; Buckner, 1967; Fisher, 1970; Webster & Wind, 1972).

Lewis et al (1978a) found that buying in the oil industry might be handled in any one of four ways: through the offices and authority of a project manager (often responsible for much of the detailed design and procurement of goods and services); through the contracts division of the oil company at headquarters; through the oil company's purchasing division; or through the oil company's local operations. Both Lewis et al (1978a) and Baker et al (1978) found that local managers were usually subject to budgetary controls and that therefore larger contracts were allocated by tender board or committee at head office, or at least referred to a head office committee for final approval.¹⁰ Thus, in the case of U.S. oil companies, guidance and approval on major contracts is sometimes sought from their head offices in the U.S.A. (Lewis et al, 1978a). Baker et al (1978) also discovered that the location of decision making differed according to the technical complexity of the product, with purchasing staff carrying most weight in the case of non-technical purchases but engineers or technicians becoming more important with respect to technical items.

In addition, every organisation will have its own set of buying processes which may well vary from one purchase to another (see, for example, Lee, 1978). The decision process will consist of several stages, ranging generally from problem recognition to evaluation of alternatives and selection of source (Webster, 1965; Fisher, 1970). As each stage is completed a process of creeping commitment to a certain supplier occurs and there is diminishing likelihood of new vendors getting access to the buying situation. The speed at which the 'buy stages' are completed will depend, for example, upon the novelty of purchase. In the case of a 'straight rebuy' of a standard product the stages will be passed through rapidly, but the process will be slower in the case of a 'modified rebuy', and slower still with respect to a 'new task'. Hence the 10% of Baker et al's interviewees which received most of their work through direct work orders were mainly suppliers of standard items purchased by existing customers in low value contracts. The 71% which received work mainly through tenders were usually responding to large orders for goods required some time ahead from any one of several suppliers on a tendering list. Finally, 19% got most of their business either by direct negotiation with the customer (normally when he required a specialist service of which there were few suppliers or had a problem requiring negotiation leading to a novel solution); by telephone

10. This is also evident from G.A. Lee's (1978) exposition of the purchasing organisation of BP Trading Ltd.

(usually in cases where the item was required quickly); or through informal channels/personal contact, usually in cases where a long-standing contract/relationship existed with the customer.

Thus, the industrial buying process is extremely complex and, as discovered by Baker et al (1978), individual oil companies have very different approaches to procuring offshore supplies and services. Nevertheless, it is vital that prospective suppliers get to know the organisation of the oil companies in order that the correct people are contacted and proposals are put to the appropriate section of the company so that they are given due consideration (Larminie, 1976), a task which is further complicated by the rapid pace of staff movement in the oil industry. Ideally, all those influencing the purchase of the product should be identified, but in practice it may only be possible to locate those that exert the greatest influence (Fisher, 1970; Robertson, 1970; Webster & Wind, 1972).

The OSO has attempted to advise supply companies in this area (Department of Energy, 1977b). Indeed for many supply companies, particularly those approaching the oil industry for the first time, the OSO's most useful advice has taken the form of specific contacts within a potential purchasing company's organisation (Lewis et al, 1978a; Lewis & McNicoll, 1978). However, U.K. suppliers cannot afford to rely on the assistance of bodies such as the OSO. The importance of U.K. suppliers undertaking their own market research is underlined by Baker et al's (1978) findings that several supply and service organisations displayed a lack of knowledge of the operators' purchasing procedures, and that the more successful suppliers were indeed those that were more aware of the purchasing processes in prospective customer organisations.

However, perhaps the biggest problem faced by U.K. supply companies has been that of persuading the oil companies, project managers etc. to abandon the close relationships that they had developed with U.S. offshore suppliers prior to the development of the North Sea and risk inadequate performance by a U.K. supplier in work not previously undertaken. Several studies have established the importance of purchasing inertia - that is, the tendency to purchase from a supplier with whom business has been done before - a feature of which is lack of search activity (Harding, 1966; Buckner, 1967; Cunningham & White, 1974; Webster, 1965;

Lewis et al, 1978a; Baker et al, 1978). Search activity is usually most limited with respect to routine, repeat purchases of low value, standard items, as found by Baker et al (1978). Although search activity may be restricted because it is easier to place an order with an existing supplier, most studies have found that doing business with well-known, reputable, established suppliers is usually a way of reducing risk (Webster & Wind, 1972; Buckner, 1967; Robertson, 1970; James, 1972; Levitt, 1967). In the North Sea the risk undertaken in selecting an untried supplier is magnified by the size of the investment incurred and the extreme effect on an oil company's cash flow and profits which can result from a comparatively slight delay in delivery (through, perhaps, missing the 'weather window') or a shutdown due to a failure of equipment. It is therefore not surprising that Baker et al (1978, p.183) should describe the rationale for operators' purchasing behaviour as "risk minimisation".

All oil companies compile their own lists of accredited suppliers (Moar, 1980; Lewis et al, 1978a). This not only restricts the number of firms which the company has to deal with, thereby making negotiation easier, but also, in times of emergency, allows quick access to an appropriate supplier. It should also be recognised that the expected value of additional information must be evaluated, as search activity is not costless (Lee, 1978; Webster, 1965; Cunningham & White, 1974), while most purchase decisions have time constraints which in any case may limit the amount of search activity which can be undertaken (Webster, 1965).

There are other possible advantages of source loyalty. Purchasing equipment identical to that already in use has been found to produce standardisation benefits such as reduced costs of spares, fewer maintenance problems and greater flexibility (Cunningham & White, 1974). Purchasing inertia is also a function of the number and depth of interfaces (James, 1972). With complex contracts, such as the platform jacket and module sub-assemblies which are especially designed for each field, the desire to retain an existing, successful multiple inter-face between oil company and designer/project manager/major contractors may be very strong. Not only will a system controlling and directing the flow of technical information have been established but also personal links will have developed between people working together for several

months - it would clearly be undesirable to re-establish all these contacts every time a new contract was placed. Similarly, permanent links may be established between, for example, manufacturers of gas turbines, generators, pumps and compressors to provide a power plant 'package' for certain platform duties. Oil companies prefer to award contracts to firms able to handle a complete package since this reduces the problems of communication, project management, planning and expediting (to check progress and working standards) (Lewis, et al, 1978a). Where this is not possible restrictions may be written into a contract requiring that the permission of the oil company be obtained before any proposed sub-contracting takes place, again in order to minimise the risk of delivery dates and/or quality of the final product failing to meet the required specifications.

A further consequence of the adoption by the oil companies of the 'systems' or 'package' approach has been the practice of simply ignoring tenders not based on the original contract specification (Lewis et al, 1978a). For example, platform modules must fit together as an integrated whole and thus alternatives to the stipulated design specifications cannot be considered, except on certain self-contained functions which do not affect the overall balance of the package. Unfortunately, the importance of adherence to design specifications was not always recognised by prospective suppliers (Lewis et al, 1978a; Moar, 1980). In addition, tendering against U.S. specifications - such as those set by the American Petroleum Institute (API) and the American Society of Mechanical Engineers (ASME) - has made it more difficult for U.K. companies in some cases, although the manufacturing specifications themselves are not unduly onerous (Lennard, 1976).

The problems associated with purchasing inertia were highlighted in the IMEG report and IMEG's recommendations in this area were fully implemented with the establishment in January 1973 of the OSO, which was entrusted with the task of ensuring that UK industry obtained a 'full and fair opportunity' to compete in supplying goods and services for the U.K. Continental Shelf (Department of Energy, 1977b). Under the terms of the Memorandum of Understanding the field operators have agreed to supply the OSO with quarterly returns of orders placed, indicating the source of various items and providing explanations, where appropriate, for the use of overseas suppliers.

IMEG (1973) found that several U.S. oil companies expected to be influenced to 'buy British'. However, IMEG's feelings on the matter - subsequently echoed by the OSO itself (Department of Energy, 1977b) - were that undue pressure on oil operators to 'buy British' would make operations in the U.K. sector of the North Sea less attractive and hence diminish exploration effort, while a U.K. offshore supplies industry developed in a highly protected domestic market would fail to remain competitive and hence would be incapable of exploiting world markets. Nevertheless, there have been occasions, such as the platform order for the Tartan field - shared by RGC and UIE having originally been awarded in total to the French company - when the field operators may have been subjected by the OSO to undue pressure to buy British. Similarly, BNOC has shown on a number of occasions that it is willing to 'root' for the U.K. supplies industry, as in the case of the power generation equipment for the Murchison platform which BNOC insisted should be supplied by Rolls-Royce although Conoco, the U.S. field operator, preferred a U.S. power plant. Certainly, there have been repeated accusations from within the E.E.C. that 'full and fair opportunity' is just a euphemism for protection (Eglin, 1977).

Purchasing inertia has also been countered to a certain extent by the need to adapt equipment originally developed for use in the Gulf of Mexico for the exceptionally harsh environmental conditions in the North Sea which, in addition, have created some entirely new market opportunities (Eglin, 1977; Lewis et al, 1978a). However, the oil industry has still tended to look to established companies for the next generation of oil equipment, partly because these companies have proven their technical problem-solving ability in the past and partly because U.K. suppliers initially did not take full advantage of the 'untried conditions' which existed (Lewis et al, 1978a; Baker et al, 1978).

The marketing lessons of inertia are clear. When it has been established in a company's favour then that company must maintain it to its advantage by generating satisfaction and ensuring that its customer believes the cost and effort of search will not bring adequate returns (Cunningham & White, 1974; James, 1972). However, in the North Sea market inertia has usually operated against U.K. companies, and evidence suggests that breaking down inertia is usually a long process requiring the devotion of considerable time and resources (Rowe, 1973).

Even gaining access to an oil company's approved vendor list will involve some or all of the following stages: investment in plant and manufacturing capacity; production and testing of equipment prior to submission to the oil company; arrangement of meetings with oil company personnel; and demonstration of the equipment's operating characteristics to the satisfaction of the oil company (Lewis et al, 1978a). Studies in other industries have shown that salesmen play an important role in breaking down inertia over a period of time in that they can provide information which aids the buyer's work simplification motivation and reduces his perception of the risk of changing supplier (Cunningham & White, 1974; Rowe, 1973). However, there is considerable doubt about the ability of many U.K. suppliers to effectively sell themselves in this manner.

Often U.K. companies have failed to make their presence known to the oil companies, apparently waiting to be approached (Baker et al, 1978; Lewis et al, 1978a).

The OSO aims to help the oil industry identify suitable U.K. suppliers while trade associations such as ABOI provide a range of marketing services for their members, such as group marketing schemes, sponsorship and support of exhibitions and conferences, and publication and distribution of catalogues. However, institutional support cannot replace competent, aggressive marketing by the supply companies themselves, both in the U.K. and the U.S.A. Furthermore, marketing activity must be continued even after a relationship has been established as this may be made redundant by staff movement (Lewis et al, 1978a; Moar, 1980).

One would expect marketing standards to improve with North Sea experience, but a report produced in 1978 by PA International showed that problems still remain (Dafter, 1978a). The report criticises a large number of offshore supply companies for being slow to react to overseas business opportunities in that 50% of firms called upon to supply sales information for potential multi-million dollar orders took over six weeks to respond, and concludes that :

"the cause of the sluggish response was not so much the common in-built resistance to form-filling, but, more disturbingly an ineptitude on the part of many companies to effectively sell themselves".

Baker et al's study, also produced in 1978, found that U.K. companies appeared to be worse than their overseas competitors in the important area of project presentation - that is, the ability to put together a credible proposal when invited to tender for work - apparently because they failed to make the necessary 'investment' (in terms of man-hours) on the preparation and presentation of their proposals. Consequently, they did not always meet the specification or the deadline on the submission of the tender, nor did they present their proposals clearly and concisely.

3.4.3 Financial Barriers to Entry

There is very little U.K. capacity in exploration drilling, subsea pipelaying and offshore installation work (other than mechanical and electrical hook-up),¹¹ areas which have in general been dominated by a few U.S. companies, although Dutch and Italian companies have achieved notable success in the offshore installation market. The cost of constructing the vessels used in these activities is considerable and few U.K. companies have been willing to undertake the necessary investment without the certainty beforehand of a contract that would guarantee the recovery of at least a substantial proportion of their outlays (Scottish Development Department, 1978). The oil companies, on the other hand, could not afford to wait for prospective U.K. suppliers to obtain the necessary plant and felt that they were already taking enough risks in the North Sea without adding to them by using unproven equipment when proven equipment was available (Larminie, 1976). Thus, U.K. companies trying to break into these markets had to convince the oil companies not only that they had the skills and expertise but also the reliable equipment required to do the job, necessitating considerable investment prior to the submission of a tender. These development costs have proved a considerable barrier to entry (Lewis et al, 1978a).

IMEG (1973) recognised that entry into these sectors might not appear profitable in the short-term, particularly in view of the uncertainties of investment in an industry of rapid technological change, but considered that in the long-term the attractions of the offshore oil business were sufficient to justify this investment, bearing in mind that other offshore provinces would be developed in the years to come. Consequently IMEG recommended provision of

11. See Appendices 3.4 and 3.5

government backed insurance against inadequate returns for U.K. contractors investing in equipment and facilities, in order to diminish the risk they faced in entering the offshore market. In addition, IMEG proposed that in certain cases, such as equipment having a range of applications (e.g. crane-barges) and therefore not tied to the requirements of a small number of contractors, the government should purchase or hire contractors' equipment to be leased to U.K. contractors. In 1977 the Scottish Office (1977a) reached the same conclusions and recommended that public sector involvement in the creation of appropriate U.K. capability should be considered. Successive governments have, however, failed to implement these recommendations.

However, it is not only in drilling and offshore installation operations that U.K. companies have either been unwilling or unable to take the risks necessary to become involved in the offshore market (MacKay & Mackay, 1975). In some cases, even where U.K. companies have contained sections or subsidiaries anxious to become more heavily involved in the offshore market their enthusiasm has not been backed by investment by their management board (Select Committee on Science and Technology, 1974).

3.4.4 The 'Track Record' of the U.K. Offshore Supplies Industry

It is vital that prospective suppliers determine the criteria which their customers utilise in their evaluations of alternative product offerings in order to ensure that the most effective appeal is made to them (Webster & Wind, 1972; Weigand, 1968). The most important purchasing criteria in the offshore market are quality, delivery and price (Larminie, 1976; Lewis et al, 1978a). U.K. industry has, in general, been able to meet the oil industry's demands for a high standard of service and adherence to contract specifications - indeed, all suppliers on an approved vendors' list will be technically and commercially qualified. Thus, the major factors in the award of a contract have generally been firm delivery date and competitive price (Baker, 1978). In particular, meeting promised delivery dates is crucial because of the huge investments involved and the high premium placed by the oil companies on production at the earliest possible date (Larminie, 1976; Daniels, 1976; Lennard, 1976; Lewis, 1978a).

The performance of U.K. companies with respect to delivery has, however,

caused some concern. In the early 1970's some U.K. companies experienced difficulty in competing with the ex-stock deliveries of U.S.-based equipment suppliers (Lewis et al, 1978a), while others did not immediately realise the emphasis placed on reliable delivery by the oil industry. Often the oil companies themselves, due possibly to their inexperience in working to such short weather windows, made impossible delivery demands, while U.K. suppliers were sometimes let down by late delivery of components from abroad. The Monitoring Section of the OSO has demonstrated in some cases that the U.K. supply company has not been responsible for the delay, while in other cases it has been able to assist in overcoming potential delays. Nevertheless, delivery problems have continued and all too often U.K. companies have deserved their reputation for poor delivery. In some sectors (such as platform and module building) there have been industrial relations problems, while in others (such as shipbuilding) inability to compete on delivery appears to be principally the result of poor organisation and low productivity.

In the early stages of North Sea oil development, oil companies were faced with a wide range of complex technological problems and consequently price was not of prime importance. However, the oil companies are becoming increasingly price sensitive as the number of the U.K. companies able to quote for any given contract expands (Baker et al, 1978; Lewis et al, 1978a) and their North Sea purchasing and programming experience builds up.

The Interest Relief Grant Scheme, which provided grants at 3% per annum on credit to finance contracts for providing U.K. goods and services, was intended to restore some degree of comparability between the credit terms available in relation to U.K. supplies of equipment to the U.K. Continental Shelf and the preferential credit rates available in respect of supplies from other countries under their national export credit arrangements. However, this system soon came under attack from two sides. Firstly, the U.K. supply industry argued that with rising interest rates the 3% relief grant failed to bridge the gap between normal interest rates and export credit interest rates. This argument was supported by reports produced by the Select Committee on Science and Technology (1974) and Scottish Office (1977a), which concluded that the interest relief system was of only limited value against the

greater support given by other countries and recommended that the assistance given to U.K. firms be brought more into line with the Export Credit Guarantee Department (ECGD) support. On the other hand, the European Commission began an action in the European court against the U.K. for operating a scheme favouring U.K. companies and discriminating against companies from the E.E.C. Thus, in September 1979 the scheme was dropped, partly because of the Commission's action and partly because it no longer represented value for money. In contrast, some sectors of the U.K. offshore supplies industry continue to be faced with strong price competition from foreign suppliers benefitting from subsidies, whether overt or concealed. In particular, subsidies provided to European shipyards have allowed them to pick up a sizeable share not only of ship orders, but also module and fabrication work and some process plant business such as pressure vessel manufacture.

While the industrial purchaser is a professional who will be concerned mainly with economic criteria such as price, delivery and quality, to view the industrial buying process as completely objective and rational is to ignore the fact that the industrial buyer-seller relationship involves interaction among people, subject to all the vagaries of human nature (Webster, 1965; Chapman, 1973; Robertson, 1970; Kellogg, 1970; Cunningham & White, 1974; Kotler, 1972; Marrian, 1973). Thus, for example, in a situation where there is substantial similarity in what suppliers offer in the way of price, delivery, etc. the purchaser has little basis for rational choice and since he can satisfy his organisational obligations with any one of a number of suppliers he may be swayed by personal motives such as good relations/friendship with the sales representative of a supplier or the 'image'/reputation of a supplier (Strauss, 1962; Fisher, 1970; Harding, 1966; Levitt, 1967). Thus, 'irrational' factors such as personal relationships can be important in industrial markets and it is therefore not altogether surprising that Baker et al (1978) found that some suppliers actually received most of their business through personal contacts/informal channels with organisations with which a long-standing relationship had been established. In addition, Lewis et al (1978a) found that in the early 1970's many suppliers trying to gain entry to the offshore market actually received their initial contracts in informal circumstances such as social functions in public

houses and hotels.

3.5 Conclusion

Some measure of the significance of the market for goods and services created by North Sea oil developments is provided by the fact that in 1980 offshore-related investment accounted for around 18% of U.K. industrial investment and around 6% of total U.K. investment (Department of Energy, 1981). However, it was stressed in section 3.2 that the nature of the offshore activity being undertaken in the North Sea will change over time. In particular, the level of development activity (and hence the volume of demand for many items of offshore-related equipment) will gradually decline as the North Sea matures as an oil province. Hence, offshore-related manufacturing employment in the U.K. may also fall.

In section 3.3 it was pointed out that although U.K. industry in general has responded reasonably well to the demands created by North Sea oil activity, the U.K. share of individual market sectors does vary enormously. The major factors influencing the performance of U.K. suppliers were then analysed in section 3.4 in order to explain this pattern of U.K. involvement in the domestic offshore market. Two distinct sets of factors influencing the success of U.K. suppliers were identified. Firstly, major problems have been presented by technological, financial and particularly marketing barriers which have restricted the freedom of U.K. companies to enter the offshore market. Secondly, even once established in the market, U.K. companies have sometimes found it difficult to provide their customers with the delivery, price and quality they need.

It can be seen from Appendices 3.4 and 3.5 that the 'U.K. share' of orders placed for capital goods has exceeded that for services throughout the 1974-80 period. It has already been pointed out (in section 3.4.1) that technological barriers to entry were generally more important in the service sector, although some manufacturing sectors such as wellhead and down-hole equipment are still dominated by foreign companies which have set up subsidiaries in the U.K., while in other manufacturing sectors such as platform fabrication and pipe-coating joint-venture companies with experienced foreign offshore suppliers have been established. The major financial barriers have

also been faced by prospective U.K. suppliers of drilling, subsea pipe-laying and offshore installation services, sectors where U.K. capability is still at its weakest. Finally, the problem of purchasing inertia was also more severe for service companies. Although some U.K. companies with experience of shipping operations were able to get into base and supply services, U.K. industry's oil-related experience prior to the development of the North Sea was largely limited to the manufacturing sector. Some U.K. manufacturers (of, for example, power and communications equipment) were able to capitalise upon previous offshore experience gained in the Middle East and elsewhere, while some U.K. pump and process plant manufacturers had worked for the oil companies on onshore refinery and petrochemical plant projects. Consequently, the 'U.K. share' of orders for pumps, process plant, communications and power plant has consistently exceeded 80%, a level of achievement which has not been maintained in the service sector.

C H A P T E R F O U R

THE OFFSHORE SUPPLIES INDUSTRY IN SCOTLAND

4.1 INTRODUCTION

In the previous chapter full advantage was taken of the published data and research evidence available in order to provide a detailed analysis of the performance of the U.K. offshore supplies industry in the domestic offshore market. Unfortunately, a similar analysis from a purely Scottish viewpoint is impossible due to the non-availability of appropriate data for Scottish industry. Nevertheless, in the first half of this chapter, which is devoted to an examination of the participation of Scottish industry in both domestic and overseas offshore markets, use is made of relevant statistical information (concerning Scottish offshore-related output, exports and employment) published by the Scottish Economic Planning Department (SEPD).

The latter half of this chapter presents a profile of the Scottish manufacturing sector of the offshore supplies industry, which constitutes the population from which the sample of respondent firms was selected. A list of the companies located in Scotland which were identified by the researcher as being involved in offshore-related manufacturing as a principal activity is provided as Appendix 4.1. It was this list which subsequently acted as the sampling frame.

4.2 THE PARTICIPATION OF SCOTTISH INDUSTRY IN OFFSHORE MARKETS

4.2.1 The Involvement of Scottish Industry in the U.K. Offshore Supplies Market

It is extremely difficult to obtain accurate information on the participation of Scottish firms in the offshore supplies business. Nevertheless, a study carried out for the Scottish Office in the mid-1970's estimated that 60-70% of the U.K.'s share of the North Sea market was being served by companies based in Scotland (Scottish Development Department, 1978). However, this study stressed that the considerable volume of subcontracting which is undertaken in the offshore industry results in a large proportion of the materials and equipment supplied by companies based in Scotland being imported from elsewhere. Total

direct North Sea-related expenditure incurred in Scotland was estimated at £110-125 million in 1974 and £150-200 million in 1975, which, when compared to total U.K. offshore expenditure of £830 million in 1974 and £1500 million in 1975, implies that the Scottish share of the offshore market was only 13-15% in 1974 and 10-13% in 1975. This report therefore concluded that the Scottish share was "surprisingly small" (Scottish Development Department, 1978, p.21). However, an alternative estimate of oil-related net output in Scotland in 1975 of £304 million has been made by the SEPD,¹ suggesting a Scottish share of the U.K. Continental Shelf expenditure of around 20% (Scottish Office, 1977b).²

The results of a similar SEPD survey carried out in 1978 are shown in Table 4.1 below. In 1977 oil-related net output in Scotland totalled £518 million, of which just over £50 million was accounted for by exports (Scottish Office, 1979c). Oil-related net output for the U.K. sector was therefore approximately £468 million, equivalent to 19% of the total expenditure incurred on the U.K. Continental Shelf - approximately £2480 million - in that year.

4.2.2 The Involvement of Scottish Industry in Offshore-related Export Markets

The first evidence of the scale of the involvement of the Scottish offshore supplies industry in export markets was provided by a survey undertaken in the latter part of 1974 by the SEPD. This survey identified over 100 offshore supply firms located in Scotland which were supplying other offshore markets overseas, albeit on a modest scale (Pounce et al, 1976). Involvement in export markets was found to be greater in the manufacturing sector, where 72 exporters were identified (30% of those responding to this section of the questionnaire) than in the service sector, where only about 20% of respondents (about 35 firms) were involved in global offshore markets.

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1. The definition of net output used by the SEPD was "gross output less purchase of fuel, raw material and supplies; payments for work given out to other establishments; payments for transport; net amount of any duties, subsidies and levies payable" (Scottish Office, 1977b, p.17).
 2. Although the Department of Energy includes expenditure on pipe-laying and installation work this sector was omitted from the SEPD survey as it was at this time treated as construction. On the other hand, the 1975 output figures include an element of exports which the Department of Energy figures do not reflect.

TABLE 4.1

Oil-related Net Output of Scottish Companies in 1977³

Industry	North Sea Oil-related Output £m	Exports £m	Total Oil-related Output £m
Primary	2.1	0.6	2.7
Construction	5.4	0.7	6.1
Services, of which	207.4	24.8	232.2
- gas, electricity & water	(4.9)	(1.1)	(5.9)
- transport & communication	(53.7)	(7.4)	(61.1)
- distribution	(22.3)	(3.9)	(26.1)
- other business services (including base services)	(89.4)	(8.9)	(98.3)
- other services	(37.2)	(3.6)	(40.8)
Manufacturing, of which	102.4	24.0	126.3
- iron & steel	(21.9)	(9.5)	(31.4)
- engineering, shipbuilding & vehicles	(60.2)	(10.9)	(71.1)
- other metal industries	(6.1)	(1.7)	(7.7)
- other manufacturing industries	(14.2)	(1.9)	(16.1)
TOTAL - All Sectors	317.3	50.1	367.4
Platforms, modules, pipecoating			92.8
Oil & gas exploration & production			57.6
Total net output of oil-related industry in Scotland			517.8

SOURCE : Scottish Office (1979c), p.11, Table 2.

It is interesting to note that the majority of the manufacturers exporting oil-related equipment were established firms, that is, firms not specifically set up to serve the North Sea oil market. Indeed, for 40 (of the larger) manufacturers (out of 63 answering this question) work in other offshore areas had predated their North Sea involvement. These companies were exporting valves, iron and steel castings, steel tubes, wire rope and oil well drilling and production equipment. Hence, only 23 (of the smaller firms) had progressed from the North Sea to the global market. The majority of the service firms involved in export

3. Figures have been rounded up to the nearest £0.1 million and may not add up to the appropriate totals.

markets were companies new to Scotland, mainly U.S. companies with considerable oil-related experience.

A more recent estimate of the involvement of Scottish industry in off-shore markets overseas results from the SEPD's 1978 survey of the oil-related industry in Scotland, the results of which are shown in Table 4.1 (above). It can be seen that the estimated value added generated by exports in 1977 was £50.1 million, approximately 14% of the value added generated by exports and sales to the oil industry taken together. Although the volume of exports is divided fairly evenly between the manufacturing and service sectors, manufacturing firms exported more of their output (19%) than firms engaged in the provision of services (11%).

The SEPD's 1978 survey also collected information concerning the destination of offshore-related exports, as summarised in Table 4.2 below.

TABLE 4.2
Destination of Exports (Responding Firms Only) in 1977

Industry	Norway %	Rest of Europe %	Rest of World %	Total Value of Sales £m	Number of Respondents
Manufacturing :					
Engineering, shipbuilding & vehicles	25	34	41	14.1	21
Other metal industries	6	22	72	2.5	10
All other manufacturing industries	3	9	88	22.8	7
Total manufacturing	11	19	70	39.4	38
Services :					
Distribution	30	32	38*	2.2	28
Other business services (including support bases)	43	16	41	6.8	15
All other services	32	61	7	6.1	8
Total services	26	37	37	15.1	51
By wholly and partly involved :					
Manufacturing :					
- wholly-involved	20	47	33	8.6	11
- partly-involved	8	12	80	30.9	27
Services :					
- wholly-involved	27	34	39	14.3	43
- partly-involved	2	96	2	0.8	8
TOTAL - All industries	15	24	61	54.5 ⁴	89

SOURCE : Scottish Office (1979c), p.12, Table 3.

4. The SEPD estimate that the respondents accounted for 75% of total export sales. This implies that total gross export sales in 1977 totalled approximately £73 million.

This table indicates that the proportion of oil-related exports which went outside Europe was significantly higher for manufacturing firms (70%) than for service firms (37%), particularly in the case of partly-involved manufacturing companies⁵ which sold 80% of their oil-related exports outside Europe.

Thus, although by 1977 there was evidence of Scottish companies exporting oil-related products and services worldwide, established partly-involved manufacturers continued to export more widely in global offshore markets than did firms in other sectors.

4.2.3 Offshore-related Employment in Scotland

In mid-1978, while offshore-related employment in both wholly and partly-involved offshore suppliers totalled 46,450, the overall impact of the oil industry in Scotland - taking into consideration both the employment associated with constructing fabrication yards, oil and gas terminals, offshore installation and pipelaying and the consumption multiplier effects - was estimated at around 60,000-70,000, as shown in Table 4.3 below.

This table also highlights the significant change which has taken place in the industrial distribution of North Sea oil-related employment since 1976. The pattern is that to be expected of an increasingly mature offshore province. With a number of fields now in production and a growing number of people working offshore, employment in the service sector increased by nearly 12,000 between 1976 and mid-1978, to reach approximately 26,450. The fact that 90% of service sector employment is provided by wholly-involved units is a further indication of the specialist nature of many services required by the offshore oil industry. The fall of 5,700 in oil-related manufacturing employment was largely due to the 6,650 jobs lost in platform and module building - especially

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5. Wholly-involved units are establishments which are for the most part relatively new, having been set up in Scotland specifically to supply the North Sea oil-related markets. Although most of them are exclusively engaged in North Sea oil work, a number also supply export markets.

Partly-involved units are established Scottish units which have succeeded in breaking into the North Sea oil market, but for whom oil-related work represents only a part of their total activities.

Some established firms have, of course, set up new branches to undertake their oil-related work and such units are included with the wholly-involved.

TABLE 4.3

Offshore-related Employment in Scotland (mid-1978)⁶

	Wholly-involved		Partly-involved		Total	
	No.of Units	Employment	No.of Units	Employment	No.of Units	Employment
Manufacturing ⁷ (change since 1976)	115	11,900 (-3,600)	210	8,150 (-2,050)	325	20,000 (-5,700)
Non-manufacturing (change since 1976)	427	24,000 (+10,500)	260	2,400 (+1,250)	687	26,450 (+11,900)
Total (change since 1976)	542	35,900 (+7,050)	470	10,400 (-800)	1012	46,450 (+6,250)
Construction					3,500	
Assumed consumption multiplier					10,000-20,000	
Estimated Total (change since 1976)					59,950-69,950 (+4,850-+5,600)	

SOURCE : Scottish Office (1979b), p.31.

concrete platforms - as shown in Table 4.4 (below) which analyses offshore-related employment in Scotland by industry. In fact, employment in the engineering sectors (excluding shipbuilding, modules and platforms) actually increased slightly during the 1976-78 period.

Generally speaking, for service firms the advantage of proximity to the market outweighs the possible difficulties of obtaining good quality labour in competition with other oil-related companies and consequently most have chosen to establish bases on the east coast, particularly in the Aberdeen and Peterhead areas of Grampian region, an area with a limited industrial heritage. Thus, Table 4.5, which analyses offshore-related employment in Scotland by region, shows that in mid-1978 21,000 non-manufacturing jobs out of a total of 26,450 (80%) were located in Grampian region. On the other hand, Lewis et al (1978a) found

6. All figures are rounded to the nearest 50.

7. Manufacturing includes concrete platforms.



TABLE 4.4

Offshore-related Employment in Scotland by Industry (mid-1978)⁸

SIC Order	Industry	Wholly-Involved	Partly-Involved	Total	Change Since 1976
II	<u>Mining & Quarrying:</u> Oil/gas exploration & production	9,900	-	9,900	+3,800
IV & V	<u>Manufacturing:</u> Chemicals, coal & petroleum products	-	300	350	+150
VI	Metal manufacture	-	2,750	2,750	-150
VII (part) & XX	Concrete & steel platforms and modules	5,900	-	5,900	-6,650
VII (part)	Rest of mechanical engineering, of which	3,600	2,400	5,950	+1,200
	- pumps, valves, compressors	(300)	(800)	(1,100)	
	- industrial engines	-	(200)	(200)	
	- other machinery (including oil tools and wellhead equipment)	(1,450)	(100)	(1,550)	
	- industrial plant & steelwork other than platforms & modules	(550)	(800)	(1,350)	
	- other mechanical engineering, including general sub-contractors	(1,250)	(300)	(1,550)	
VIII & IX	Instrument & electrical engineering	650	450	1,100	+400
X & XI	Shipbuilding & marine engineering	1,100		1,100	-1,000
XII	Metal goods (not elsewhere specified)	1,300	1,050	2,350	+550
XII to XIX	Other manufacturing industries	100	400	450	-250
	<u>Total manufacturing</u>	11,900	8,150	20,000	-5,700
XXII	<u>Services :</u> Transport & communication	4,650	550	5,200	+1,650
XXIII	Distributive trades	1,850	750	2,600	+1,000
XXIV & XXV	Professional, scientific, banking etc.	3,700	900	4,550	+3,000
XXVI	Miscellaneous (including catering & diving)	3,900	250	4,100	+2,350
	<u>Total Services</u>	14,150	2,400	16,550	+8,100
	TOTAL - All Industries	35,900	10,550	46,450	+6,250

SOURCE : Scottish Office (1979b), p.32.

8. All figures are rounded to the nearest 50.

that many manufacturers and consultants preferred to stay in the West of Scotland which has an established industrial infrastructure, a strong engineering tradition and a pool of skilled labour. Nevertheless, the SEPD's 1978 survey of oil-related employment found that 20% of respondent companies reported labour recruitment problems, many of which were not simply of a short-term nature (Scottish Office, 1979a). Both the SEPD's Scottish survey and Hunt's (1978) study of the Grampian region found that the greatest shortage was for skilled manual workers, particularly welders, although there was also an increasing shortage of professional workers such as engineers, technicians and sales personnel. Clearly,

TABLE 4.5
Offshore-related Employment in Scotland by Region (mid-1978)⁹

Region	Activity	Wholly Involved	Partly Involved	Total	Change Since 1976
Fife	Manufacturing	1,500	350	1,850	-400
	Non-manufacturing	-	-	-	
	Total	1,500	350	1,850	
Grampian	Manufacturing	3,400	1,200	4,600	+11,200
	Non-manufacturing	19,500	1,500	21,000	
	Total	22,900	2,700	25,600	
Tayside	Manufacturing	1,150	150	1,300	+1,000
	Non-manufacturing	1,000	100	1,150	
	Total	2,150	300	2,450	
Highlands & Islands ¹⁰	Manufacturing	4,850	150	5,050	-1,050
	Non-manufacturing	2,000	200	2,200	
	Total	6,900	350	7,250	
Lothian, Central, Borders & Dumfries & Galloway ¹¹	Manufacturing	400	850	1,250	-100
	Non-manufacturing	800	250	1,050	
	Total	1,200	1,050	2,250	
Strathclyde	Manufacturing	600	5,400	6,050	-4,400
	Non-manufacturing	600	350	950	
	Total	1,200	5,800	7,000	
TOTAL Scotland	Manufacturing	11,900	8,150	20,000	+6,250
	Non-manufacturing	24,000	2,400	26,450	
	Total	35,900	10,550	46,450	

SOURCE : Scottish Office (1979b), p.33.

9. All figures are rounded to the nearest 50.

10. Total estimated oil employment in Highland region is 5,600 and in the Island areas 1,650.

11. Total estimated oil employment in Lothian region is 1,850; in Central Region 400; and in the Borders and Dumfries & Galloway negligible.

continuing shortages of skilled labour and infrastructure deficiencies - such as the poor road connections to the south, inadequate air freight facilities and irregular international sea freight connections highlighted in the Grampian study (Hunt, 1978) - constrain the ability of Scottish companies to expand their offshore-related activities.

Table 4.5 also highlights the shift towards the production phase of activity. The rapid expansion of the service sector is reflected in the massive increase in the oil-related employment in the Grampian region, which now accounts for 55% of total employment in wholly and partly-involved firms in Scotland. On the other hand, the increase in oil employment in the Tayside region since 1976 has been almost entirely attributable to a few manufacturing companies. The loss of platform and module fabrication jobs is largely responsible for the fall in oil employment in Strathclyde, Fife and the Highlands & Islands.

4.2.4 Summary

The Scottish share of the U.K. offshore market is probably in the region of 20%. However, as the emphasis in the North Sea moves towards the production phase of activity so the importance of general services, such as base and transport services, will increase. As proximity to the market is vitally important to companies operating in these areas companies located on the east coast of Scotland should dominate these sectors and thus, over time, the overall Scottish share of the total U.K. market should improve. Although platforms will also normally be fabricated as close to the market as possible, geographical location is less important in engineering and the Scottish share of these market sectors is therefore likely to be less creditable. Nevertheless, in mid-1978 there were 325 offshore-related manufacturing units in Scotland employing approximately 20,000 people in oil-related work.¹²

4.3 THE SCOTTISH MANUFACTURING SECTOR OF THE OFFSHORE SUPPLIES INDUSTRY¹³

4.3.1 Shipbuilding

Drilling Rigs

Although there was a shortage of drilling vessels in the period 1973-75,

12. See Table 4.3 above.

13. Appendix 4.1 provides a list of companies located in Scotland involved in offshore-related manufacturing as a principal activity.

new construction on a massive scale in the first half of the 1970's produced a surplus of all three types of rigs by 1976-77. However, thereafter rising oil prices once again stimulated exploration and in May 1980 only 14 mobile drilling units (out of a world total of 450) were without contracts, and most of these were undergoing repairs.

For many years U.S. jack-up yards - principally Levingston, Bethlehem, McDermott and Marathon - dominated the market. However, the expansion of offshore oil activities in south-east Asia forced these U.S. companies to consider setting up yards closer to this market - there are now five in Singapore - in competition with Japanese yards such as Hitachi Zosen, Mitsui and Mitsubishi, while North Sea developments brought competition from several European yards such as IHC and RSV (both of Holland), CFEM (France), Arendal (Sweden) and Navire (Finland).

The Clydebank yard currently owned by UIE is the only U.K. yard to have been successful in the jack-up market. This yard (which had won jack-up orders previously in its days as John Brown and UCS) attracted several orders following its take-over in 1972 by Marathon Shipbuilding, but by late 1976 was facing closure. However, a speculative £13 million order placed through BNOC and the Scottish Office provided a further 14 months employment for the yard's workforce of 1100 men. This rig was eventually sold to Penrod Drilling (U.S.) which then ordered a second identical rig. Nevertheless, once again in Spring 1979 the yard was only saved from closure by an order placed by BNOC. Marathon's Clydebank yard has undoubtedly been a high cost operation, while the yard's exclusion from the subsidies available to the nationalised shipyards through the intervention fund has also made it difficult for the yard to meet (often subsidised) overseas competition. The yard's unhappy record was in marked contrast to that of Marathon's other yards in the U.S.A. and Singapore and thus in April 1980 the yard was taken over by the French group UIE which intends to undertake modernisation and expand the yard's capabilities to include the construction of new kinds of production platforms and associated platform fabrications such as decks and modules. However, the first order to be won by UIE (in June 1980) was for a £16.5 million jack-up drilling rig for a Mexican drilling company.

Drillships present no construction problems for established shipyards and Scott Lithgow have built two dynamically positioned drillships under licence from IHC Gusto of Holland. However, no new drillships were

ordered worldwide in 1978 and some existing units are even being converted to other uses such as ocean mining vessels. Scott Lithgow's main competitors include IHC themselves, Mitsui (Japan) and several U.S. shipbuilders.

The market for semi-submersible drilling rigs was particularly badly affected by the construction boom in the first half of the 1970's. For example, only 5 units were ordered in 1978, compared to 60 units on order in 1975 for delivery 1975-77. Several semi-submersible drilling units are currently being used as production platforms, accommodation units and construction and diving support units.

The most successful yards in this sector include Marathon, Levingston, Bethlehem and Avondale of the U.S.A.; Mitsubishi and Mitsui of Japan; CFEM (France); Aker (Norway); and Rauma Repola (Finland). The involvement of U.K. yards is, however, limited to Harland & Wolff's (Belfast) construction of the Sea Quest in the mid-1960's, to a Sedco (U.S.) design.

Support Vessels

Although U.K. shipyards have the capability to build support vessels they have been notably unsuccessful in securing orders, apparently falling down on ordinary commercial factors such as marketing, delivery and particularly price. For example, a survey of the support vessel market carried out in 1976 (Schleibach, 1976) identified 390 support vessels under construction in 82 shipyards worldwide. Despite the fact that U.K. ownership extended to 69 of these, only 26 were being built in the U.K., compared with 35 in Japan, 46 in Norway, 50 in Germany, 56 in Holland and 99 in the U.S.A. The support vessel construction boom which occurred in the mid 1970's (particularly in Norway where very large tax incentives provided by the Norwegian Government encouraged small investors to build boats in order-hungry Norwegian yards) has still to fully work its way through the system, and there is still little demand for new vessels. However, in August 1979, 7 vessels which were being built for U.K. owners were under construction in Norwegian (4) and Japanese (3) yards.

Several Scottish shipyards failed to gain entry to the offshore market, while Hall Russell & Co. Ltd. suffered from the escalation of wages in Aberdeen and eventually withdrew to concentrate on specialised vessels, leaving only Scott Lithgow and Ferguson Bros. involved in the support

vessel market. Ferguson Bros., part of the Scott Lithgow group, aim to satisfy the demand for smaller support vessels, leaving Scott Lithgow to build the larger craft.

Ferguson Bros. have undertaken detailed design studies of seismic vessels and coring vessels (used for taking cores of the seabed at platform sites) but as yet have failed to win an order and the market for new vessels of these types is currently depressed. The yard's offshore construction experience is, in fact, limited to two anchor-handling tug/supply vessels specifically designed for the North Sea and delivered in 1974/75. However, as North Sea operations move into the production phase the trend is towards the use of larger supply vessels with the considerable load-carrying capacity required in the 'milk-run' phase.

The multi-purpose support vessel (MSV) was developed in response to an apparent need in the North Sea for around ten large, semi-submersible vessels capable of dealing with emergencies such as blow-outs and yet at the same time able to 'earn their living' on a day-to-day basis by assisting maintenance and construction work, utilising in the process their extensive workshop and saturation diving facilities. However, it now seems that only one or two MSV's may still have to be ordered (in addition to the four purpose-built vessels already ordered) as the government and oil companies now apparently consider that it may be sufficient to have a MSV within 24 hours' steaming time of any offshore installation, in which case five vessels could cover the U.K. sector of the North Sea. Three of the MSV orders have gone to foreign yards (in Finland and Japan) and the fourth was only awarded to Scott Lithgow after the BNOC agreed to take a 25% share in the vessel and pay an equivalent share of the bill. The two U.K. yards which tendered for the latest MSV order, Scott Lithgow and Harland & Wolff, both submitted bids of approximately £70 million, compared with the winning bid of £42 million submitted by Rauma Repola of Finland. In addition, all four overseas yards tendering guaranteed delivery in two years or less, while the U.K. yards would not commit themselves to a firm delivery date but admitted that construction could take three years.

U.K. shipyards have also failed to win orders for derrick and pipe-laying vessels. The failure of U.K. contractors in this area has probably contributed to the poor performance of U.K. shipbuilders. In addition, IMEG (1973) argued that the absence of a suitable U.K. crane was a

serious obstacle, pointing out that up to 1972 construction of large derrick vessels had been confined to those countries in which crane-makers were able to supply very large machines, namely the U.S.A., Japan, Holland, W. Germany and Italy. There has, in any case, been a worldwide downturn in the construction market and in mid-1979 around 30% of the world's fleet of 140 large construction vessels was under-utilised.

The new generation of larger, more sophisticated diving support vessels (DSV's) which are now being employed in the North Sea (alongside the converted supply ships and broad-beam stern trawlers which were used as DSV's in the earlier part of the 1970's) are also being built overseas. These modern vessels often incorporate dynamic positioning systems and usually have a diving spread capable of holding 8 - 20 men under compression. However, many of these DSV's were delivered in 1978-80 at a time when exploration and construction activity had declined and it will be difficult for these specialised North Sea craft to secure work in other offshore provinces in competition with cheaper vessels. Consequently, future DSV's are likely to be dual purpose vessels which can perform as supply boats when required but are fitted out in such a way that a few days' conversion enables them to undertake a diving support role.

Other Fabrication-Work

Scott Lithgow have signed a joint-venture with CFEM (of France) to develop, market and construct a steel gravity oil platform for the U.K. sector,¹⁴ and also have a collaboration agreement with Deep Oil Technology Inc. (of the U.S.A.) to market and build their design of TLP. In addition, British Shipbuilders are a licensee for a TLP developed by BP and Vickers Offshore which is claimed to be suitable for field developments in up to 1800 feet of water.

Several U.K. yards undertook module building studies, because it appeared that this might be an appropriate outlet for shipbuilding and outfitting skills, only to discover that they could not meet the fierce competition from smaller, private enterprise module builders. In addition, Burntisland Fabricators' unhappy experience using a converted Fife shipyard for module building has provided evidence that a shipyard may not, after all, be the best site for these activities.

14. Although despite tendering for several field developments they have as yet been unsuccessful.

Nevertheless, Scottish shipyards have periodically undertaken offshore-related fabrication work, a typical example being Govan Shipbuilder's fabrication of the platform leg joints for the Maureen platform.

Summary

The performance of Scottish (and indeed U.K.) yards in the construction of drilling rigs has been very disappointing. Undoubtedly the domination of the world exploration drilling market by U.S. drilling contractors has helped to steer the majority of rig orders to U.S. yards specialised in their requirements. Nevertheless, starting from a similar position to U.K. shipbuilders, yards in France, Holland, Finland and Norway have enjoyed considerable success.

Similarly, U.K. yards in general have had only limited success in the offshore support vessel market. However, the roles of the various types of offshore support vessels are continually being reappraised, providing new opportunities for U.K. yards proposing new, appropriate design solutions to enter the market, assuming they can match overseas yards on price and delivery.

The offshore-related efforts of Scottish shipyards have been concentrated in the Clyde yards of the Scott Lithgow group and Marathon Shipbuilding. Indeed, Scott Lithgow are stronger in the offshore business than any other U.K. yard while Marathon were the only jack-up rig manufacturers. Unfortunately, not even these yards have achieved even a fair measure of success in the offshore market.

4.3.2 Platform Fabrication

Out of a total of 25 steel platform orders which have been placed for the U.K. sector of the northern North Sea, U.K. platform fabricators have won 18 outright and shared 3 others (with UIE of France), while UIE and Dragados Y Contrucciones (Spain) have each won 2 outright. Of the 5 U.K. yards which have shared these orders only Laing Offshore, of Teeside, is not situated in Scotland. Laing Offshore constructed 3 platforms before announcing their withdrawal from platform business in 1978 following 2 years without an order (although Laing were tempted into tendering for the Magnus platform in 1979).

Ayrshire Marine Constructors (AMC), a joint-venture between the

Scottish Weir Group and CBI Constructors, London subsidiary of Chicago Bridge & Iron (of the U.S.A.), only entered the platform business in May 1979 when they secured the Maureen contract, a steel gravity platform designed by Technomare (Italy). AMC employ around 450 men at Hunterston in Ayrshire - using a deep water site originally intended for concrete platform construction - and are the only steel platform constructor on the west coast.

Apart from the Maureen platform, the steel platformshave all been conventional jackets which are constructed on their side in a dry dock and, on completion, floated out. The main requirement for their construction is flat land alongside moderately deep water and the three remaining Scottish steel platform yards are all located on the east coast, as close as possible to the North Sea oil fields. These yards are at Nigg Bay on the Cromarty Firth, Ardersier on the Moray Firth and Methil in Fife, and are operated by Highland Fabricators, McDermott Scotland and Redpath de Groot Caledonian Ltd. (RGC) respectively.

Highland Fabricators, a joint-venture between Brown & Root (U.S.) and George Wimpey (U.K.), have won six platform orders and employment at the yard has varied from 1,000 - the yard's base or static workforce, including a direct labour force of 400-500 - to a peak of around 2,500. McDermott Scotland, which has a U.S. parent well-established in the offshore business, has won four orders for the U.K. sector outright and shared a fifth with U.I.E., but has nevertheless been forced periodically to lay off some of its workforce as platforms neared completion. The Methil yard, originally owned by Redpath Dorman Long (North Sea) Ltd., a subsidiary of BSC, was virtually closed in 1976 at a time when it had failed to complete its first two platform contracts on time, partly due to industrial disputes. The yard was saved initially by Department of Energy intervention securing for the yard part of the Tartan platform contract. More decisive, however, was the merger with de Groot (of Holland) announced in April 1978, since which time RGC has won orders for a small wellhead jacket for the Fulmar field, the major (£37 million) Beryl B jacket and also shared the £32 million North Cormorant platform with UIE.

Thus, all the yards have suffered from the uneven pattern of ordering of platform jackets and decks and consequently all have been forced to consider diversification alternatives. Highland Fabricators

now have a pipe-rolling facility and have built modules for the Ninian North platform, while in 1979 RGC built floatation tanks and pile-guides for the North Cormorant platform and McDermott Scotland a template for the South Montrose field.

Once the base of a concrete platform has been fabricated in a dry dock it is floated out under its own buoyancy to a sheltered deep-water site where it is sunk progressively as the high concrete towers are built on top of it. Water of the required depth is found in the U.K. only on the west coast of Scotland and it was here that the two successful concrete yards were established, at Ardyne Point in Argyll and Loch Kishorn in Wester Ross, by McAlpine Sea Tank (a joint-venture between Sir Robert McAlpine and Sons of the U.K. and French designers Sea Tank & Co.) and Howard Doris (also a U.K.-French joint-venture) respectively.

McAlpine Sea Tank (MST) have built two concrete platforms and Howard Doris one platform. The other four concrete platforms for the U.K. sector - three of which have been built by Norwegian contractors at Stavanger and the other by Andoc of Rotterdam - were ordered in 1973-74 when U.K. capability was insufficient to meet demand. For this reason the government invested around £20 million in the establishment of concrete platform construction sites at Portavadie in Argyll and Hunterston in Ayrshire. Unfortunately there were no further orders for concrete platforms from 1975 onwards and the prospects for the concrete yards are not good, especially since the delivery records of the two experienced yards were very disappointing. Although MST (which has three basins which have been idle since summer 1977) considered module fabrication, it concluded that a west coast site was inappropriate. In contrast, although Howard Doris¹⁵ has continued to tender (without success) for platform orders, it spent over £1 million on developing its facilities to widen the range of work that could be undertaken. Subsequently, in May 1979 HDN won the deck contract for the Maureen platform. In addition, both HDN and MST have developed new designs of concrete and steel/concrete hybrid structures.

Summary

North Sea experience has allowed U.K. platform fabricators to build up considerable offshore design expertise and a whole range of designs for

15. Howard Doris has now joined with NAPM of Holland to form HDN Offshore Structures.

offshore structures - including steel jackets, concrete structures, steel/concrete hybrids and floating platforms - have been developed in recognition of the changing requirements of the oil industry in the North Sea. U.K. platform yards have also considerable production experience. For example, Highland Fabricators' experience led them to abandon the traditional fabrication procedures used in the Gulf of Mexico and to completely redesign the construction process, resulting in platform construction time being halved (Lewis & McNicoll, 1978).

However, the projected trend towards the use of subsea completions and floating platforms will not benefit the platform yards. For example, it appears that the hull and deck of the first TLP (for the Hutton field) will be built separately and mated at a deep-water site. Whereas the deck may be built by one of the platform yards, the hull may well be placed with a shipyard as the steel and construction are of a different type and the hull could be launched from a normal shipyard slipway.

Furthermore, although some U.K. platform yards have in the past built small items (such as deck and bridge sections) for the Dutch and Norwegian sectors of the North Sea and McDermott Scotland built a £9 million jacket for the Namorado field off Brazil,¹⁶ overall U.K. yards have been very unsuccessful in winning platform orders for other offshore areas.

4.3.3 Modules and other Steel Fabrications

Module fabrication yards must be adjacent to navigable waterways as the huge steel 'boxes' can only be moved by sea once complete. Most module fabricators will fabricate any structure up to 3,000 tons in weight which can be floated out on a single barge, such as helidecks, flare booms, mooring buoys, walkways etc.

The most successful module yards have been Redpath Engineering, William Press, SLP Group and Charlton-Leslie Offshore (all of England), together with Motherwell Bridge Offshore (MBO) of Leith and Kestrel Marine of Dundee. However, even these yards have periodically been forced to reduce their employment levels as contracts neared completion. John Brown Engineering Offshore and Foster Wheeler Offshore, both on the Clyde, were initially successful in obtaining North Sea contracts but

16. This jacket, towed out in January 1979, sank during a winter storm off Hartlepool in N.E. England.

eventually closed their yards altogether, while Burntisland Engineers also experienced considerable difficulty in attracting sufficient orders to keep their yard open. MBO and Kestrel Marine build accommodation modules - which for 200 men cost around £5 million - of the 'sheer face' type which are built as one massive multi-storey block and fitted out internally as required.

An alternative form of accommodation module consists of a number of containers, each weighing around 10 tons, built into a main structural steel frame to form a total package three to five storeys high which can be lifted and towed as one unit. The main Scottish supplier of this type of modular unit is R.B. Farquhar, although other companies such as Carronhall Engineering, Ferguson Sea Cabs and Richard Irvin Fabricators also provide containerised units for a variety of uses.

In the face of strong competition from European fabricators and shipyards - which have allegedly benefitted from shipbuilding subsidies in their module building activities - such as Container Safe (Sweden), CFEM (France), HCG (Holland), Penn & Bauduin (Holland), Cork Shipyard Offshore Ltd (Eire), and Dragados Y Construcciones (Spain), U.K. module yards have been unable to secure more than 50-60% of the U.K. module market.¹⁷

Apart from the platform and module yards there are a large number of Scottish companies fabricating a wide range of products for the offshore market, from flare booms, walkways and ladders to buoyancy tanks, mud silos, pipework and small pressure vessels. In addition, several of the many Scottish companies which specialise in sub-contracted inspection, maintenance and repair work - and therefore have welding and machining capabilities - also have fabrication facilities, although they are usually only capable of small, basic fabrications such as skips, tanks, skids, cargo baskets, bottle racks etc. Most of these companies are located on the east coast, close to the major supply bases.

Also, included in Appendix 4.1 under the classification 'metal goods not elsewhere specified' are Irvent (Metal Products) Ltd. and Fraser & Borthwick Engineering Services which are sheet metal enclosure fabricators specialising in instrumentation panels, wall-mounting enclosures etc. This category also includes Channel-Aire Systems Ltd. and Haden Offshore which specialise in the design, fabrication and

17. See Appendix 3.4

installation of platform ventilation, pressurisation and air conditioning, and Rollstud Ltd. and Prosper Engineering Ltd., which are major suppliers of studbolts to the offshore industry. Finally, Bruce Anchor, Norbrit Engineering, Seaward International, Turners of Shettleston and Baldt (U.K.) Ltd. manufacture mooring buoys, marine fenders, anchors, chain cable and associated equipment.

4.3.4 Steel Pipe and Pipe-Coating

In the early 1970's the British Steel Corporation (BSC) underestimated the demand for high quality steel that would be created by North Sea development and, as a result, BSC's performance (in terms of both price and delivery) suffered. However, by the mid-1970's BSC were producing most of the steel used for rig and platform construction in the U.K.

BSC's underestimation of the scale of the pipeline network that would be required in the North Sea was a particularly expensive error. It was not until 1978 that BSC had operational facilities for the production of large-diameter subsea pipe (following the £10 million development of their Hartlepool mill), until which time an important market¹⁸ had been abandoned to imports, principally from W. Germany and Japan.

Pipe-coating for the U.K. sector is dominated by two Scottish companies, M.K. Shand and British Pipecoaters Ltd. (BPCL), the latter being a joint-venture between H.C. Price Co. (U.S.), Bredero (Holland) and the British Gas Corporation. The pipeline construction market in the North Sea is currently healthier than it has been for some time. Several feeder lines are currently required to link new fields into the established oil trunk lines. In the gas sector the most important project will be the gas gathering pipeline systems (in the U.K. and Norwegian sectors), although pipeline work will also be generated by further development of the gas fields in the southern North Sea and the exploitation of the Morecambe gas field on the west coast.

The principal offshore-related products of BSC's Scottish plants are casing, used to line the well, and tubing, through which the oil is produced. BSC invested £44 million on developments at the Clydesdale and Imperial Works in Lanarkshire specifically for the casing/tubing market and by 1976 BSC's Tubes Division had secured 85% of total casing orders for the U.K. sector, although large diameter casing - 18½" and 20" - is still imported from W. Germany, Italy and the U.S.A.

18. In 1975, for example, large diameter pipe accounted for 90% of all pipe ordered for the U.K. sector.

4.3.5 Oil Tools and Wellhead Equipment

The six major U.S. wellhead equipment manufacturers all have a manufacturing base in the U.K. However, as the full range of wellhead equipment is not manufactured in the U.K. some is still imported from the U.S.A. Indeed, the 'U.K. share' of orders for wellhead and completion equipment was only 56% in 1976.

The National Supply Co. has been manufacturing oil field equipment in the U.K. since the 1920's but only recently decided to establish a Londonderry plant to specialise in the manufacture of wellhead equipment. Cameron Iron Works and McEvoy Oilfield Equipment manufacture wellhead equipment in England, and the only wellhead equipment manufacturers located in Scotland are Gray Tool Co., FMC Corporation and C.E. Vetco Offshore. National Supply, Cameron, McEvoy and FMC have the capability to supply equipment for wellhead completions both above and below the surface, but Gray Tool and Vetco are part of the same group - Combustion Engineering - and while Gray Tool concentrate on land and platform well-heads Vetco have specialised in subsea equipment, not only subsea 'Christmas trees' (in which they lead the field) but also templates, marine riser systems, guideline tensioners etc. Riser tensioning systems are also manufactured by Rucker in the U.S.A. and by Brown Bros. & Co. Ltd., Edinburgh, which also make motion compensators.

Whereas most companies tend to specialise in particular areas of oilfield tools, Halliburton Manufacturing & Services and Baker Oil Tools are both U.S. companies manufacturing a similar but wide range of oilfield equipment. For example, Halliburton and Baker manufacture oil well cementing equipment - including pumping units, mixers and bulk handling equipment - in competition with Carslake Ltd. of Bedford (a subsidiary of Gemoco of the U.S.A.) and imports from B.J. Hughes (of the U.S.A.). In addition, Baker and Halliburton manufacture fairly specialised down-hole valves, pumps and other equipment, although the very specialised equipment, such as formation testing equipment, tends to be imported from the U.S.A. Other companies in this area include TRW Mission Ltd. (manufacturing in N. Ireland) and Drexel Engineering Services Ltd., Montrose.

Baker and Halliburton also manufacture the more basic down-hole tools - fishing tools, drilling bits, collars, pipe etc. - although these represent a fairly small part of their production. These drilling

items can be produced using 'machine-shop technology' and there are a number of companies in Scotland manufacturing these items.¹⁹ A large proportion of the basic down-hole tools used offshore are sold through local supply houses which either subcontract the work to local API machine shops or purchase from the local sales and service outlets which have been established by several U.S. manufacturers including Smith International (which includes Drilco, Smith Tool and Servco) and Hughes Tool.

Finally, the U.K. has little capability in the manufacture of drilling derricks, drawworks, rotary tables and swivels, and these items of drilling equipment are largely imported from the U.S.A.

4.3.6 Deck Plant : Cranes, Hoists & Winches

Approximately 90% of the cranes used in offshore work are supplied by U.S. manufacturers, principally American Hoist & Derrick, Manitowac and the Clyde Iron Works. U.K. success has been restricted to the smaller end of the market, such as the pedestal-mounted cranes used on platforms, supply vessels etc. which have been developed by Priestman Bros. Ltd., Ransome Rapier, Stothert and Pitt and Brendan Butler, all of England. Atlas Hydraulic Loaders Ltd (of Blackwood, Strathclyde) manufacture a range of small loaders and cranes suitable for pedestal mounting on rigs and supply vessels although involvement in the offshore business is at the moment very limited. Several Scottish companies, including Norson Power Ltd (Glasgow), have the capability to supply the hoists, winches, and other handling equipment used offshore, but none is heavily involved in the offshore market. Similarly, not even the major suppliers of the portable pneumatic tools used in rig/platform building and maintenance work - namely Ingersoll Rand (U.S.), Atlas (W. Germany) and Consolidated Pneumatic (a U.S. company with a manufacturing plant in Aberdeen) - are significantly involved offshore.

4.3.7 Process Plant, Valves, Pumps & Compressors

In 1979 offshore oil and gas accounted for more than half of the total expenditure on process plant by the U.K. chemical, oil, gas and electricity industries. Fortunately this important market is dominated by U.K. manufacturers, several of which had considerable experience in dealing with the oil industry prior to North Sea development, allowing an 80-90% U.K. market share to be achieved 1974-76.

19. See Appendix 4.1.

The process plant installed on a platform is a complicated 'package' of pressure vessels, filters, valves, heat exchangers, tanks and pipework. The term 'pressure vessel' covers anything from the primary separators - into which the crude oil flows at full wellhead pressure, requiring the vessel to be 3½-4" in thickness - to boilers and storage tanks. The separators, which separate out the oil from the gas or oil from impurities will themselves vary in size and thickness depending upon the oil/gas mixture, the number of separators being used, etc, the largest separators usually being located on gas platforms.

Scottish vessel manufacturers can perhaps be classified into three categories with respect to the North Sea market. Firstly, vessels of considerable thickness are the province of specialist manufacturers such as Babcock & Wilcox and Motherwell Bridge Engineering (although the English firm Robert Jenkins is probably the leading supplier to the North Sea market). The second group of companies, which are unable to supply very specialised, thick-wall pressure vessels, include Henry Balfour, Largo Lintec and A.F. Craig & Co. Ltd. Finally, storage and floatation tanks may be fabricated by a host of companies, including several fabricators in N.E. Scotland such as Speyside Engineering, Elbar Engineering and Hunting Oilfield Services.

Several established Scottish engineering companies - including Babcock & Wilcox and Motherwell Bridge - have also attempted, with varying degrees of success, to attract orders for the fabrication of steel tubulars, platform leg joints and piles.

Ball, plug, check and other types of valves and pipe fittings are used in most sectors of offshore activity, although the major area is the pipeline connecting field and terminal. Pipeline valves are usually of the ball valve type since these provide a tighter shut-off than conventional gate valves and are more suitable to automatic operation. The Scottish ball valve plants most heavily involved offshore are both subsidiaries of U.S. companies - Cameron Iron Works manufacture fully-welded ball valves in direct competition with the bolted ball valves produced by T.K. Valves. Another U.S. valve company, Keystone Valve, recently purchased Cannon Valve (which specialises in the manufacture of small stainless steel ball valves). There are several companies manufacturing other types of valves in Scotland but none are heavily involved in the offshore market. With the influx to the U.K.

of several U.S. companies specialising in oilfield valves, the U.K. valve and pipe-fitting industry has the capability to supply most of the requirements for the North Sea, and in 1976 captured 70% of this market against strong competition, particularly from Japan.

Several U.K. pump manufacturers were supplying the oil industry prior to North Sea developments and hence had little difficulty in coming to terms with API standards. Over the period 1974-76 the 'U.K. share' of the U.K. offshore market was upwards of 80%, reflecting the capability of the U.K. pump industry to satisfy the offshore oil industry's needs (although several of the U.K.'s major pump manufacturers are subsidiaries of overseas companies).

Pump manufacturers to have achieved success in the North Sea market include Byron Jackson (U.S.); Ingersoll-Rand (U.S.), which has a U.K. subsidiary at Gateshead; Sulzer (Switzerland), which also has a plant in England; the SPP Group (England); Mather & Platt (England); the Bingham Pump Division of David Brown Gear Industries, which are a major supplier of U.S. pumps manufactured under licence in England; and Weir Pumps of Glasgow, the U.K.'s largest and probably most broadly based pump manufacturer, which supplies a range of pumps to the oil industry, including those for water winning, water injection, fire-fighting and pipeline duties. Scotland's other major pump manufacturer, Hayward Tyler of East Kilbride, is not involved offshore.

The 'U.K. share' of the air and gas compressor market was 60% in 1976. As in the pump industry, several major foreign compressor manufacturers have established or purchased plants in the U.K. Among those companies heavily involved offshore are Worthington, Dresser Clark, Ingersoll-Rand, Elliott and Solar Turbines (all of the U.S.A.), and Sulzer (of Switzerland).

4.3.8 Power Plant

Probably the most successful manufacturer of the gas turbines used on North Sea platforms is Ruston Gas Turbines Ltd. of Lincoln, a U.K. subsidiary of GEC, although strong international competition is provided by Kongsburg (Norway), Sulzer (Switzerland), Hispano Suiza (France), Solar Turbines (U.S.), and several others. Diesel engines are also in use on North Sea platforms, on standby power generation, general pumping and fire pump duties, as well as on supply vessels as main propulsion and onboard generating power units. There are no Scottish

manufacturers in this sector active in the offshore market, although Dawson-Keith Ltd. and Paxman Diesels Ltd. are both English manufacturers which have achieved some success in competition with imports from, for example, the diesel engine division of Caterpillar Tractor (U.S.)

Generators manufactured by Parsons Peebles, Edinburgh, are in use in the North Sea in association with both Ruston and Kongsburg gas turbines, while their motors are being used to drive pumps and compressors on around 15 fields in the North Sea. Strong competition is provided by around a dozen main international rivals, including GEC and Westinghouse of the U.S.A.; Hitachi, Toshiba and Mitsubishi of Japan; and several European manufacturers. Manufacturers of motors and generators also tend to manufacture control and switch gear and other electrical equipment ranging from small electrical accessories through to large transformers. In addition there are specialist manufacturers of switch and control gear and other associated equipment, several of which are located in Scotland. Anderson Strathclyde and Bauteil & Baylor are probably the Scottish motor control gear manufacturers most involved in the offshore market.

Several U.K. power plant manufacturers had many years prior experience of dealing with the oil companies, while the excess capacity which existed in the power industry for much of the 1970's allowed U.K. manufacturers to meet the offshore oil industry's delivery requirements with little difficulty. Consequently U.K. manufacturers have been able to dominate the supply of power plant to the U.K. sector, securing 70-85% of the market in the period 1974-76.

4.3.9 Communications, Instrumentation and other Electrical/Electronic Equipment

The 'U.K. share' of orders for communications equipment for the North Sea exceeded 80% throughout the 1974-76 period. All the equipment for tropospheric scatter systems has been supplied by Marconi Communications, while GEC's Marconi Electronics group also supplies the more standard microwave radio systems and complete onboard communications and entertainment systems (including TV and radio) and navigational aids, in competition with Plessey EAE and Pye (from plants located in England) and Ferranti's Scottish group. However, competition is increasing from U.S. companies such as Motorola Electronics and RCA.

The offshore oil industry is now a major user of computers for the control and monitoring of oil production, processing and transportation. The computer-based process control, monitoring and information system installed on a platform will consist of a computer, such as the Ferranti Argus 700G manufactured in N.W. England, with telemetry and telecontrol systems from, for example, Ferranti's Scottish group.

The offshore oil industry has also provided a sizeable market for companies specialising in flow metering and electronic instrumentation, including safety systems for gas, smoke and fire detection as well as a number of instruments which have been designed specifically for offshore use, such as anchor-chain footage counters, safe-load indicators for cranes, subsea riser angle indicators and mud pump stroke counting systems. Scottish companies designing and manufacturing their own instrumentation include V.U. Data Ltd., Banchory Instruments Ltd., Osprey Electronics Ltd., Moray Electronics, Glen Instruments Ltd., East Anglian Electronics, Daniel Industries Ltd. and Ferranti's Scottish group.

The rapid expansion of subsea activities has also provided market opportunities for electronic equipment manufacturers. Scottish companies involved in the specialist area of deep diving communications include UDI and Helle Engineering Ltd., although at the moment the latter merely assembles and services equipment in Scotland. UDI are also the main Scottish supplier of underwater acoustic systems, sonar equipment, seabed profilers etc. Finally, Osprey Electronics is the main Scottish manufacturer of underwater TV and still-camera and video systems, the supply of which is dominated by U.S. companies.

4.3.10 Underwater Engineering

In September 1979 more than 1500 divers were working in the North Sea (very few at less than 300 feet) and more than 100 deep diving systems were employed, including 20 sophisticated DSV's. Although U.K. shipyards have been unsuccessful in winning DSV orders, U.K. companies have nevertheless attempted to supply diving systems - consisting of diving bell and handling system, decompression chambers etc - for vessels built abroad, and Seaforth Maritime Ltd. have achieved some success. Nevertheless, Comex Industries of France is probably the world's leading manufacturer of diving systems and submersibles.

Diving bells are designed to transport divers to the working depth, enable them to carry out observation dives and then allow their transfer to the decompression chamber with maximum safety and comfort. Those manufactured by Comex, for example, are designed for 2-3 divers working at depths of 80-450 metres and are connected to the DSV by a lifting cable and an 'umbilical'. Comex have also developed a manipulation and observation bell for use in up to 1,000 metres equipped with thrusters - which allow it to move around in a radius of up to half the depth at which it is operating - and two hydraulic manipulators which can be used for undertaking work on submarine structures or on the seabed itself.

Vickers Oceanics - part of the Vickers Offshore Engineering division bought by the National Enterprise Board and now known as British Underwater Engineering - were the first company to introduce submersibles to the North Sea. However, it is Comex which have developed a complete range of manned observation, lock-out and rescue submersibles, which operate independently of the mother ship. Two or three man observation submersibles are suitable for survey, inspection and manipulation tasks. The diver lock-out submersible is a fairly new species of subsea vessel which combines the advantages of the diving bell and the submersible in that it operates with a high degree of manoeuvrability independently from the mother ship and is capable of transporting divers.

The increase in the number of remote-controlled subsea work, survey and inspection vehicles (RCV's) in use in the North Sea is partly due to improvements in photographic equipment which have meant that RCV's are able to supplement some of the work previously done by divers. UDI have developed a seabed orientated RCV called 'Seabug'.

Finally, Sub Sea Services Marine Ltd. are a Scottish manufacturer and supplier of diving and underwater lighting, cutting and welding equipment.

4.3.11 Other Manufacturing Industries

Scottish manufacturers of protective clothing supplying the offshore market include Oilfield Safety Products Ltd., Angus Sewn-up Ltd., Delcoats Ltd., Field Gear Ltd., Multifabs Ltd., and Halket & Adam Ltd., while oilfield rubber products, such as rubber connectors and protection

items, are manufactured in Scotland by Webco Industrial Rubber Ltd. and Lassalle Manufacturing (U.K.) Ltd., and hose and associated fittings by Stratoflex (U.K.) Ltd. PPS Glassfibre Ltd. and Aberglen Seamarks both manufacture a wide range of marine products such as buoys and floats. Finally, Carlyle Wishart & Co. Ltd. and Offshore Interiors specialise in the design and supply of non-combustible furniture and fabrics for use in modules etc. offshore, while John Kelly and Son manufacture and distribute catering hardware and galley equipment.

4.3.12 Summary

This section has presented a profile of the Scottish manufacturing sector of the offshore supplies industry. Over 130 companies - listed in Appendix 4.1 - have been identified as being involved in offshore-related manufacturing activity as a principal activity, and these companies manufacture and supply a wide range of products to the offshore oil industry.

4.4 CONCLUSION

Chapters 2, 3 and 4 have provided a detailed examination of the industry in which the study was undertaken, namely, the offshore oil and gas supplies industry. The first of these chapters outlined the nature and costs of the differing technological requirements of each of the three distinct phases of offshore operations - exploration, development and production. In particular, it was pointed out that the demand for most items of offshore-related equipment is associated with the development phase of activity. However, it was pointed out early in Chapter 3 that as an oil province matures the level of development expenditure will fall, in both relative and real terms. Evidence presented in Chapter 3 demonstrated that the importance of development activity in the U.K. sector of the North Sea was already falling in relative terms (as operating expenditure increases) although, as yet, there is no conclusive evidence of a long-term downward trend in development expenditure in real terms. When the real decline in development activity does occur it follows that the demand for many items of offshore-related equipment will fall and hence that there might be a reduction in offshore-related manufacturing employment which, it was explained in Chapter 4, provides approximately 20,000 jobs in Scotland alone.

One way offshore-related manufacturing employment might be maintained would be for U.K. manufacturers to win a larger share of the declining domestic market. However, it was pointed out in Chapters 3 and 4 (which presented a detailed analysis of the performance of U.K. and Scottish companies respectively in meeting offshore-related demands) that the U.K. share of the domestic market for offshore-related equipment is already greater than that for services, and that there are certain factors which are likely to prevent a further major increase in the overall U.K. share of the domestic offshore-related equipment market. An alternative method of sustaining offshore-related manufacturing employment in this country would be to increase the share of offshore markets overseas supplied by exports from the U.K. Indeed, it is this alternative which provides the major focus for this study and it is to an examination of the factors which might influence the export performance of the Scottish manufacturing sector of the offshore supplies industry that the following two chapters are devoted.

CHAPTER FIVE

MANAGERIAL ATTITUDE TO EXPORTING

5.1 INTRODUCTION

It has been stressed that most offshore-related manufacturing employment is closely associated with the level of development expenditure and that development activity will fall in both relative and absolute terms as an offshore province matures. As far as the U.K. sector of the North Sea is concerned, it will be shown in Chapter 11 that development expenditure will decline in real terms quite sharply over the period 1982-85, although the world offshore market will continue to expand significantly throughout the period to 1985.

In the following section various alternative corporate strategies are considered and the conclusion reached that the most appropriate strategic alternative available to companies faced with a declining domestic market and expanding overseas markets is usually market development. In this discussion the author has adopted the traditional approach to corporate strategy, in which the firm is seen as a rational decision-making unit which, having analysed its own strengths and weaknesses and the opportunities provided by its external environment, will select the course of action most likely to concur with the achievement of corporate objectives. It is, however, recognised that this is a simplification of the real world situation in which established firms with established policies and organisation structures based on previous experience may exhibit a tendency towards inertia, that is, an unwillingness to accept the risk involved in implementing a new strategy. Alternatively, the execution of a sub-optimal strategy may be less the result of the operation of bureaucratic conservatism than the consequence of the existence of powerful individuals within the decision-making unit with interests and objectives which conflict with those of the firm as a whole. Having focussed on market development, alternative methods of exploiting overseas markets are then briefly outlined and the conclusion reached that exporting would appear to be the exploitation strategy most likely to ensure that offshore-related manufacturing activity is maintained in Scotland.

The factors which influenced the performance of U.K. offshore suppliers in the domestic market were analysed in Chapter 3. Marketing overseas will not only accentuate some of the difficulties experienced in the domestic market - due to the separation of the manufacturer from the customer - but will also create some entirely new problems. Hence, the remainder of Chapter 5 and the whole of Chapter 6 are devoted to an analysis of evidence from studies of exporting performance in other industries, this survey of literature being undertaken in order to identify those factors which might affect the export performance and export potential of the Scottish manufacturing sector of the offshore supplies industry. Special emphasis is placed on the examination of those factors which are under the control of the firm's management, in particular, the attitude which management adopts with respect to exporting and the exporting strategy it implements. While Chapter 6 analyses the relationship between alternative export marketing methods and exporting success, section 5.3 discusses the factors likely to influence managerial attitude to exporting which, in section 5.4, is itself shown to be a major determinant of whether the resources necessary for successful exporting are committed.

5.2 EXPORTING AS A STRATEGIC ALTERNATIVE

The importance of setting objectives in several areas of business, including profitability and turnover, is now generally accepted. A company which fails to meet these objectives due to a contraction of the domestic market may react in several different ways. Firstly, no action - other than the downward revision of objectives - may be taken, in which case the company will decline in step with the market. However, inability to achieve objectives may produce an organisational crisis (resulting perhaps in changes in either executive staff or ownership) and lead to the reappraisal of strategy following an up-to-date analysis of both the enterprise and its environment.

Unwillingness to accept lower objectives may lead to disinvestment, with the firm withdrawing from its current activities prior to the contraction enforced by market forces. On the other hand, if corporate objectives are seen primarily in terms of post-tax profits, the selected course of action may be to accept lower turnover and

attempt to maintain the profit level by redeploying resources more efficiently and hence reducing costs. However, if the overriding objective of the firm is growth, or perhaps even long-term survival, then one of four main expansion strategies may be chosen.

Firstly, it is doubtful whether increased market penetration - that is, increased sales of the same product to the same markets by means of increased marketing effort - is the most appropriate expansion strategy given a declining domestic market.

Although a second alternative, product development (which is the marketing of new products to the same market) offers the advantage of launching new products in a familiar environment, selling through established marketing channels etc., it suffers from the same problem of dependence upon a declining domestic market. Thus, as far as offshore supply firms are concerned, the marketing in the North Sea of new products used at the development phase of oil activity would appear to be an inappropriate strategy. However, in their product development supply firms may take note of, and adapt to, the changing structure of the oil industry in the North Sea by developing products and/or services required at the production phase of activity - for example, a manufacturing company may evolve a maintenance capability. In this way a supply firm may be able to maintain or even expand offshore-related sales turnover in the North Sea market, although with this strategy the expanding global offshore market is still ignored.

Market development - that is, the marketing of the same or similar products to new (product or geographical) markets - stresses product technology as the 'common thread' between the present and the new strategy, while dependence upon the existing declining market is reduced. Firstly, supply companies may be able to utilise their oil-related expertise and market their offshore-related products, (following, perhaps, a certain degree of adaptation) in other indigenous markets. However, some specialised supply firms will be unable to utilise their expertise and resources in non-oil sectors while the opportunities for other supply firms to transfer their skills will be restricted by the size of local, onshore markets, especially given the remote location of many supply firms (Moar, 1980). On the other hand, as the demand for their products in the North Sea declines, many offshore suppliers may be able to take advantage of their offshore-related expertise by exploiting the expanding global offshore market.

The final alternative is diversification, which is the most extreme (and most risky) strategy in that it involves a simultaneous departure from both familiar products and markets, which suggests that the company may lack both the technology and the marketing expertise to be successful in the new business. Diversification does, however, offer the opportunity to reduce overdependence on a single technology, customer etc., and may provide greater opportunities than are available with alternative strategies, as in the case where R & D has produced diversified by-products with outstanding sales potential. Thus, in general, the increased flexibility and enhanced opportunities provided by diversification must be weighed against the increased risk it entails (Ansoff, 1968).

This analysis suggests that, in general, the most appropriate strategy for the Scottish manufacturing sector of the offshore supplies industry may be (geographical) market development, as this approach would build upon the technological expertise which Scottish companies have developed during their period of involvement in the North Sea, while it also focusses attention on the expanding global market.

Having focussed on market development, the various strategies for exploiting the global market must now be considered. For most firms, exporting - that is, the marketing of goods and services across national frontiers - is the first stage in the development of international business activity (Tookey, 1975; Hood & Young, 1979; McDonald & Parker, 1969). A firm would generally rather achieve its market development objectives by exporting than by any other exploitation strategy as a one-plant organisation affords the advantages of maximum control, maximum identification and quantification of risks and minimisation of administration and capital outlay. In time the expansion of sales in an overseas market may warrant the establishment of a marketing subsidiary there and eventually even a manufacturing plant may be set up overseas, perhaps as a joint-venture with a local partner(s) (Tookey, 1975). However, the primary motive for direct investment overseas is often defensive rather than aggressive. Direct investment may be undertaken partly as a response to the threat provided by a series of visible and invisible trade barriers, as well as a result of other export problems experienced, such as increasing transport costs and delays, distribution difficulties, etc.¹

1. These factors are discussed in greater detail in section 5.3.3 below.

(Caves, 1972; Vernon, 1973; Hood & Young, 1979; Brooke & Remmers, 1970; Dunning, 1972c).² Finally, licensing of proprietary technology provides an intermediate exploitation strategy. Licensing takes many forms, but generally is the lease or sale of technology, and/or know-how, and/or patents, copyrights etc. to a firm or individual in return for a consideration which may be in the form of cash, equity participation, products, cross-licensing (or a combination of these), with payment being on either a once-and-for-all or a continuous basis (Robinson, 1973).

A foreign subsidiary may manufacture and supply equipment (originally produced by the parent company) not only to its local market but also to other overseas markets and perhaps even to the parent company's domestic market. By displacing the parent company's output for domestic and/or export markets, direct investment may reduce manufacturing employment in the home country. However, direct investment in an overseas country need not preclude exports to that market. Indeed, in some cases direct investment overseas may even lead to an increase in the exports of the parent company through the generation of additional sales of components or even finished products (Hood & Young, 1979). In this way, direct investment overseas may lead to an increase in employment in the home country. Also, direct investment overseas may create additional employment in head office administration and services as a result of the need for a larger central body to control the expanding company (Hood & Young, 1979). Overall, whether direct investment in a manufacturing subsidiary will increase exports from the parent company depends very much upon the share of the market that exports would have captured had direct investment not been undertaken. However, although there is a shortage of hard, empirical evidence on this subject, according to one survey over 80% of the U.S. firms with manufacturing subsidiaries in Canada claimed that their exports had been either raised or unaffected as a result of local production (Dunning, 1972a). This suggests that the employment provided in the U.S.A. by these firms may also have increased as a result of direct investment in Canada (if one assumes that this overseas investment did not result in less investment in the U.S.A.). Thus the impact of direct investment overseas by Scottish offshore-related manufacturers on offshore-related manufacturing activity in Scotland is far from clear. Nevertheless, it is obvious that overseas market development by means

2. Hood & Young (1979) and Dunning (1979) describe factors such as the size of overseas markets and trade barriers - which strongly influence the choice of strategy for exploiting overseas markets - as 'location specific factors'.

of exporting does offer the opportunity for Scottish offshore-related manufacturers to capitalise on their technological strengths while maintaining employment in this country.

5.3 FACTORS INFLUENCING MANAGERIAL ATTITUDE TO EXPORTING

Many of the factors which influence a firm's export performance³ are beyond its control. For example, an individual firm - assuming that it possesses neither monopoly power nor considerable political influence - can do very little about exchange rates, the costs of labour and capital and the level of government support given to exporting firms. It is with these 'uncontrollable' factors that international trade theory is mainly concerned. International trade theory explains the composition of a country's exports in terms of demand conditions and the relative scarcity of production factors and natural resources. It gives little attention to the function of the individual firm which is regarded as fulfilling a passive role simply responding to changes in its environment. However, different firms in the same industry, operating in the same market and faced with the same exchange rates and other government-created conditions can be seen to adopt completely different export marketing policies and achieve different levels of exporting success. This suggests that the factors over which firms do have control - such as organisation, market selection, marketing mix and, to a certain extent, size - do have an important influence on their export performance (Hirsch, 1971). Indeed, Tookey (1964) believes that the effectiveness of the decisions taken by individual managements has a far greater influence on export performance than do the macro-economic factors mentioned above.

In the review of literature presented below attention is focussed on the influence of those factors over which the firm does exercise some control, in particular :-

- (1) the managerial attitude to exporting (examined below)
- (2) the export strategy adopted (discussed in the following chapter).

However, a management's attitude towards exporting will obviously depend upon its perception of 'uncontrollable' macro-economic variables and

3. From the point of view of a firm's management the profitability of exports would be the most obvious measure of export performance. However, the researcher has adopted the point of view of the

thus many of these factors will be considered from this viewpoint.

5.3.1 Future Market Trends

In their 5-industry study⁴ Cooper et al (1970) found little support for the 'pressure hypothesis', which predicts a negative relationship between the pressure of domestic demand and short-term variations in exports. The authors suggest that this may have been partly due to the imperfect substitutability of home and export products and the substantial long-term investment which may be required for overseas marketing (which may mean that incremental exporting is only possible in the long term). Moreover, firms heavily involved in exporting were, in any case, insulated from the effects of domestic deflation, while firms exporting only a small proportion of their output were unwilling to enter untried markets at a time when an adverse situation existed in the domestic market.

In the situation where entry into export markets is possible only in the long-term, it would be a function of its management's expectations about the future position of export markets and the length of the domestic recession (Cooper et al, 1970). For example, at the most basic level, management's export aims will depend upon how essential exports are seen to be for long-term survival. Hence, it may be expected that to offshore manufacturers (especially those wholly-involved offshore) whose products are closely tied to the development phase of activity the exploitation of export markets will appear more essential than it will to other manufacturers (and service companies) whose products (and services) are demanded during the production phase. There is indeed evidence of a tendency for firms to be content to operate in their domestic market as long as it offers adequate commercial reward and it is often only when a constraint in the domestic market starts to operate, with the result that sales and profits show signs of erosion, that firms consider 'filling the gap' through the exploitation of export markets (Majaro, 1977; Hood & Young, 1979).

Management's export aims may also depend upon the relative profitability of domestic and export sales, not only how profitable they actually are

economic planner interested in whether the industry under study can increase its volume of exports, and hence the percentage of total turnover exported has been taken as the measure of export performance.

4. This study covered the pottery, motor cycle, pedal cycle, office machinery and domestic appliance industries.

but also how profitable they are expected to be by management (Cooper et al, 1970). For example, is an equal rate of return expected or is a contribution to fixed costs all that is required?⁵ As regards actual profitability, evidence suggests that costing methods often do not allow comparisons of the profitability of domestic and export orders to be made (Tookey, 1964). When comparisons of relative profitability are made, exports are usually considered to be less profitable than domestic sales (Tookey, 1964; Cooper et al, 1970; MacKay, 1964; Political and Economic Planning, 1965; Cranch, 1974), because exporting involves additional marketing, administration and other costs, while export markets are also often considered to be more competitive than domestic markets (Hirsch, 1971; MacKay, 1964).

In his study of the hosiery and knitwear industry, Tookey (1964) found that the assumed unprofitability of exports was mainly responsible for the general lack of enthusiasm for exporting, while in their national survey Political and Economic Planning (PEP, 1964) discovered that the relatively lower profitability of exports as against domestic sales constituted the third greatest barrier to exporting. In contrast, in their study of the pottery and motor cycle industries, Cooper et al (1970) found no obvious relationship between the relative profitability of home and export sales, as perceived by management, and the desired export/domestic sales ratios. This suggests that in these industries there are other more important motives for exporting than profitability, as discussed in the following section.

5.3.2 Reasons for/Benefits of Exporting

At the level of the firm exporting is not usually an objective in itself but a means by which corporate objectives can be achieved (Tookey, 1975). Management's attitude to exporting may therefore depend upon the benefits which it expects to reap through exporting.

First, firms may export to achieve growth which is impossible (or at least more difficult) in the domestic market, due perhaps to a contraction of the market or anti-monopoly legislation (Tookey, 1964; Sweeney, 1970; Wainwright, 1971; McMillan & Paulden, 1974). In fact, the desire to

5. Duguid & Jaques (1971) argue that although the profitability of exporting is usually compared with that of domestic marketing, the real question should be whether total sales are more profitable with or without exports.

expand when this was impossible in the domestic market was found by PEP (1965) to be the most important export motivation, while Cooper et al (1970) also found this motive to be of prime importance in the office machinery and domestic appliance industries.

Exporting, as a form of market diversification, will also spread risk and increase flexibility (Tookey, 1964; Holton, 1969; Hirsch, 1971). Indeed, Cooper et al (1970) found this to be the most important motive for exporting in the pottery, motor and pedal cycle industries. As far as the offshore supplies industry is concerned, if risk can be spread the effects of a downturn in demand from any one area - whether this arises from a change in political circumstances, a fall in the exploration success rate, a deterioration in the economics of field development (as occurred in the North Sea where spiralling costs made marginal fields unprofitable prior to the more recent oil price increases), or the increasing attraction of other areas - can be minimised. For example, Gaffney (1976) argues that the British experience in the first half of the 1970's of a boom (lasting under three years) followed by a downturn is typical of the oil business, and points to similar post-war booms in Libya, Venezuela, parts of Africa, Alaska, the Middle East and south-east Asia. In fact, Gaffney (1976) regards protection against such a downturn in a particular country or area to be the major justification for expanding a domestic supply company's operations into international markets.

Companies which have taken the step of becoming involved in international markets should also be in a better position to identify and take advantage of global opportunities (Gaffney, 1976). Furthermore, they should be better able to monitor global competitors, which should allow comparisons of efficiency and competitiveness to be made (P.E.P., 1965) and may stimulate the introduction of new products and/or techniques (Duguid & Jaques, 1971), as Cooper et al (1970) found had happened in the pottery industry. Thus, offshore suppliers may wish to become involved in oil operations in the North American Arctic, as the extreme environment may stimulate technological developments in which they will want to participate.

Exporting may be undertaken in order to attain economies of scale via large-scale production (PEP, 1965; Cooper et al, 1970; Deschampsneufs, 1967). Companies may also try to export surplus home production

(National Economic Development Office, 1970; Robinson, 1973; Deschampsneufs, 1967) although, as has already been pointed out, Cooper et al (1970) found little evidence of this happening in the short-term. Alternatively, firms may attempt to export a product outdated in the domestic market. In this respect it is interesting to consider the concept of the product life cycle which suggests that a product in a particular market will go through a typical pattern of growth and decline during its life, passing through introductory, growth, maturity and decline phases (Vernon, 1972; Wells, 1972; Tookey, 1975). While a product may have reached the maturity or decline phases in the domestic market, in other (export) markets it may still be at the introductory or growth phases. An exporting firm should therefore investigate the position of its products in terms of the life-cycle in world markets in order to identify in which markets it may hold a competitive advantage. Thus, export opportunities are not restricted to technologically advanced products and products outdated in an advanced country may nevertheless be adequate, or perhaps even more suitable, for oil operations in, for example, India, where offshore conditions are less severe and indigenous maintenance capability lower than in the North Sea. Given that developing countries are often worried if they can afford to become involved themselves in oil operations (Tanzer, 1978) 'outdated' technology may actually be welcomed by these countries assuming that, *ceteris paribus*, it would be cheaper than buying the most up-to-date alternative.

However, if exporting is undertaken in order to achieve economies of scale or to sell off surplus or outdated equipment it may indicate that export policy is subordinate to domestic sales policy. This could result in a situation where, for example, the emphasis will be on selling the domestic product range overseas (ignoring necessary adaptations to local conditions) or exports are considered of secondary importance (resulting in failure to meet export delivery dates) (Wainwright, 1971; Livingstone, 1976; Tookey, 1975).

Management executives may also be personally motivated to export. They may view exporting as a prestigious activity - as Cooper et al (1970) found was sometimes the case in the pedal cycle and office machinery industries - or may see it as being their patriotic duty to export since this would be in the national interest (Tookey, 1964; PEP, 1965).

However, exports often commence by accident without any conscious decision to export being made. A company may start exporting simply because it is approached by an agent who thinks he can do a good job in a certain area or because it happens to receive an order or an enquiry from overseas (McMillan & Paulden, 1974; Kotler, 1972; Day, 1976; Tookey, 1975). Moreover, a firm may continue to export (without a great deal of thought being given to the wisdom of this activity) merely because the current management has inherited a tradition of exporting (PEP, 1965; Cooper et al, 1970).

However, according to the 'classical' theory of international trade, the main reason for exporting is the desire to exploit a comparative advantage held over global competitors. The Department of Energy has frequently argued that the North Sea has provided an extremely difficult and demanding environment with the result that developments in the North Sea have given U.K. offshore suppliers a technological lead over their competitors. However, there are three main points which must be made in relation to this supposed technological advantage. First, only certain offshore activities are what might be regarded as 'high technology'.⁶ Indeed, a significant proportion of offshore expenditure comprises general industrial equipment or services which any host nation with a strong engineering industry will have the capability to supply. In addition, there are many supplies (such as sand, gravel, cement, additives and other minerals) that are certain to be purchased domestically in every country - for example, these items were domestically purchased from the very beginning of oil operations in Venezuela (Harris, 1971). Traditionally the backward linkage effects for the petroleum industries in the 'primitive' economies, such as those in the Middle East, have not been strong (Mikesell, 1971b). However, as these nations gradually industrialise, opportunities for exporting intermediary products will decrease. In Venezuela, for example, items such as oil casing, pipe and oil-well tubing which were originally imported were, by the early 1970's, being supplied by domestic industry, as were chemicals, paints, fabricated metal products and cable (Harris, 1971).

Second, there has been comparatively little indigenous development of specialised oil-related technology, with the result that much of the specialised oil technology used in the North Sea is still controlled by foreign, principally U.S., companies.

6. See p. 32.

Finally, some of the technologically advanced oil-related products which have been developed in U.K. companies in the past 8 - 10 years have been designed with the North Sea specifically in mind and thus, in their present form, may not represent superior products with respect to other offshore areas. While there are areas (such as the Gulf of Alaska) where the environmental conditions are as demanding as those in the North Sea and which will therefore demand equipment of a similar degree of technological sophistication, in other areas such as south-east Asia products developed over ten years ago for the Gulf of Mexico may well be ideal. For example, jack-up drilling rigs which once worked in the Gulf of Mexico and the Persian Gulf are now operating in south-east Asia. Thus, the advantage of superior technical design may disappear in some export markets, owing to the greater suitability of other products for the market conditions (Deschampsneufs, 1967). However, although North Sea technology may be more advanced than is absolutely necessary for areas such as south-east Asia, it is doubtful if the 'best' technology will not be embodied in new equipment purchased for offshore activity in such areas. For example, platform structures may be smaller and simpler but may nevertheless embody the most advanced technological developments resulting from wave motion studies etc. undertaken in the context of the North Sea. In this way U.K. suppliers may still be able to reap an advantage from their technological leadership.

Nevertheless, although to some companies overseas markets may be simply an extension of the domestic market, with only minimal adjustment being required before becoming involved in business in new markets, for many firms product adaptation and development may be necessary and thus entry may not be as costless as might be imagined.⁷ For example, overseas operations may require alterations to the operating characteristics of the equipment, alterations to the materials used in fabricating the equipment and extension of the product line offered.

Thus, to summarise, the 'technological advantage' held by the U.K. offshore supplies industry is probably less important in terms of export markets than might at first be expected since much of the equipment used in offshore activities is of a general nature, while even some of the specialised or offshore-related equipment which is not already controlled

7. Adaptation of the product and other elements of the 'marketing mix' is discussed in greater detail in the following chapter, particularly section 6.3.1.

by foreign companies is within the capability of many countries (although the fact that a lot of oil equipment is not 'high technology' may be less important than the fact that it is generally thought by those outside the oil industry to be 'high technology'). Moreover, even with respect to technology where U.K. companies do hold an advantage over global competitors modifications may be required before the equipment is suitable for export markets.

However, the North Sea has provided a good training ground for U.K. industry and U.K. firms trying to break into global markets have the benefit of their experience in dealing with the oil industry in the North Sea (Baker et al, 1978). This experience gives them several advantages over firms in other countries which, although they may have considerable industrial experience, have no prior experience in dealing with the oil industry. For example, U.K. industry has considerable production experience which in itself could lead to a cost advantage. U.K. firms are also now familiar with the purchasing behaviour and special requirements of the oil industry.⁸ Furthermore, those U.K. firms experienced in dealing with the oil industry in the North Sea will have established their credibility with the oil companies and hence will not have to devote much time or effort to establishing their competence in the eyes of the oil companies in other offshore areas. That is, a company which is established in the industry in one country has already paid its 'entrance fee' (Gaffney, 1976). Indeed Larminie (1976) considers that the establishment of a working relationship with foreign oil companies operating in the U.K. - and in particular to get onto their bidding lists - is perhaps the best chance of achieving exports.

Thus, the built-in inertia of the oil industry which operated against U.K. industry in the North Sea may now start to work for established U.K. firms. Moreover, as offshore operations in the next ten years are likely to continue to be concentrated in areas where environmental conditions are less severe than in the North Sea, the physical environment is unlikely to prove a stimulant to technological change - and hence provide opportunities for new market entrants - to the same extent as it did in the North Sea (although the financial environment - the pressure of escalating costs, the need for earlier oil and cash flows etc. - could replace the physical

8. Knowledge in these areas was shown to be vital in section 3.4.2 above.

environment in this role). However, the trend for host governments to demand more control over oil operations⁹ may adversely affect the export potential of U.K. offshore suppliers. Obviously, in a country in which the government has adopted a passive role with respect to oil activities there may well be more scope for oil companies to specify U.S. and U.K. equipment than where 100% state control exists. In the latter situation the government will be able to maximise its influence over imports of oil equipment and services, while buying will have passed into the hands of local people who will have to develop their own contacts with manufacturers and may, in fact, be ignorant of the ability of U.K. suppliers to provide offshore oil-related equipment. Nevertheless, the lessons learned in the North Sea, both technical and financial, should give established offshore suppliers - not just U.K. but also U.S., Norwegian, Danish, Dutch, French etc. - an advantage when it comes to exploiting overseas markets.

The Department of Energy (1977a; 1978) have also claimed that U.K. offshore suppliers "have won the reputation for skill, reliability and experience to compete strongly for offshore-related orders anywhere in the world". Unfortunately, the analysis of the U.K. offshore supplies industry's 'track record' undertaken above¹⁰ suggests that, on the contrary, the almost standard U.K. industrial problems of inability to meet delivery dates and inept marketing could check the development of exports to global markets.

5.3.3 Problems Associated with Exporting

Management's aims with respect to exporting may depend upon its perception of the problems associated with exporting, the most obvious of which are visible trade barriers such as tariffs/import duties, import quotas and domestic content regulations.

Import duties are taxes (normally paid by the importer) which are assessed by governments on imported products to protect domestic industries (by giving them an advantage over foreign competition), to generate government revenue, or to discourage imports for balance of payments reasons. Many studies have highlighted the significance of import duties as a barrier

9. As identified by Tanzer (1978).

10. See section 3.4.4 above.

to trade, including those by Cooper et al (1970), MacKay (1964), Industrial Market Research Ltd (1978) and PEP (1965).

An import quota, which limits the quantity of a certain product which can be imported during a specific period of time, is also an effective method of import control (Tookey, 1964; Robinson, 1973; Alexandrides & Moschis, 1977; Wells, 1973). Often this form of control is implemented through the use of an import licence which the importer must secure from his government in order to receive a specific shipment from overseas. Several countries (including Brazil) also have import deposit regulations which require a certain proportion of the value of the proposed imports to be lodged with the importing government a certain number of months in advance. This increases the cost of the imported goods from the importer's point of view and so discourages imports (Alexandrides & Moschis, 1977; Heyman, 1975; Smith, 1979).

Import equalisation taxes may be added to the price of imports to compensate for the situation where the exporting country has given the exporter a subsidy. Under the General Agreement on Tariffs and Trade (GATT) export subsidies are illegal, but the U.K. government, for example, provides exporters with quasi-subsidies such as export insurance guarantees and sponsored trade missions and market research. Importing countries may also operate anti-dumping legislation to protect domestic industry from imports being sold at artificially low prices.¹¹ In addition, a country which is a member of a custom's union and is suffering severe balance of payments difficulties may make a 'special pleading' to the union - within which there are normally nil duties between members and a common tariff with countries outside the union - to increase tariffs unilaterally across the board.

Local industry may also be supported by some form of domestic content regulations. For example, the Iranian government specified as early as 1954 that in cases where a similar product in terms of quality and price was available locally the oil industry should meet its requirements from Iranian rather than foreign sources (Bartsch, 1971), while Brazil operates a 'similarity law' banning imports of capital equipment which could be

11. For an exporter with idle capacity exporting may be justified at any price which covers variable costs and makes some contribution to overheads.

produced in Brazil (Smith, 1979). However, often this form of protection is covert and as such falls into the category of 'invisible' barriers to trade. Whereas visible trade barriers can be removed through bi-lateral discussions, invisible barriers are more difficult to negotiate simply because they are, to some extent, secret (Wells, 1973; Robinson, 1973). For example, overseas governments may decide 'off the record' to purchase only locally manufactured goods or goods which have had a certain percentage of value added locally. Alternatively, like Mexico they may try to ensure that local joint-ventures (with majority local ownership) are established. However, it should be noted that this type of restriction is not only implemented by developing countries. The U.S. market has been closed to non-U.S. flag vessels and also largely to non-U.S. equipment (Lennard, 1976). For this reason the OSO has been trying to promote joint-ventures between U.K. and U.S. companies, with U.K. companies providing the technological expertise and the U.S.A. the manufacturing capability (Andrews, 1978).

Invisible trade barriers are numerous (see Day, 1976). For example, the calculation of customs duties is often very complicated, time-consuming (and hence costly) and may cause delivery delays leading perhaps to the loss of future orders. Alternatively, imports may be discouraged by customs officials 'going by the book' - that is, doing everything precisely according to customs regulations, thereby slowing down import clearance - or by increasing export documentation requirements. Another possible problem is the wide range of technical/performance standards which exist overseas (Tookey, 1975; Wainwright, 1971; Majaro, 1977).

The administration and documentation costs of exporting can be a major problem (Industrial Market Research Ltd., 1978; Day, 1976; Robinson, 1973). According to the Simplification of International Trade Procedures Board (SITPRO), the administration of correctly executed export-import transactions on average accounts for approximately 14% of the prime cost of exported goods. When allowance is made for those procedures and documents which are inevitable, the net avoidable cost is estimated at around 7-10% (Export, May, 1970).

Furthermore, exporting companies are finding it increasingly necessary to make 'facilitating payments' to minor officials in foreign countries with regard to documentation, dock or customs clearances. Similarly,

'kick-backs' - that is, payments made by suppliers to employees of customer organisations not legally entitled to them - are also expected in many countries. Indeed, in several countries corruption appears to be an accepted way of life which the national authorities appear unable or unwilling to overcome (Schmitthoff, 1978; Kotler, 1972).

Use of these protectionist measures increased during the 1970's - due mainly to the world recession, inflation, problems with the balance of trade and the deceleration in world trade - and towards the end of the decade had reached a level not experienced for twenty years (Barling, 1978). The attitude of a host government with respect to restrictions on imported offshore-related technology will, however, depend partly upon the speed at which they desire their indigenous oil and gas resources to be developed. If oil revenue or reduced dependence upon imported oil is regarded as the prime objective then the host government may opt for rapid development, in which case it must be prepared to accept that the demand for oil equipment which is thereby created can be satisfied only by imports from the U.K., U.S.A. and elsewhere. On the other hand, they may adopt the 'infant industry' approach and try to maximise the domestic content of oil-related purchases by deciding upon a slow rate of development of their oil and gas resources and by giving maximum support to the domestic supplies industry. This choice is one which must be made by developed and developing countries alike. The Norwegian Government, for example, has tightly controlled the pace of offshore development and implemented protectionist policies. In fact, the U.K. has received only about 6% of the Statfjord field orders, despite its share (in the order of 16%) in that field.

In addition to the visible and invisible trade barriers discussed above there are several other factors which may restrict exports, including the inaccessibility of overseas markets in terms of distance and/or modes of transportation or communication. Distance affects the cost of transportation¹² and also puts exporters at a disadvantage compared with local producers with respect to the time required for physical transportation of goods to the market, a factor which could be particularly important to exporters of offshore-related equipment given the importance assigned to swift delivery by the oil industry. Moreover, there are

12. Hood & Young (1979, p.377) describe transport costs as a 'natural' trade barrier, as distinct from tariffs, import quotas etc. which are 'artificial' trade barriers.

still risks involved in shipping goods overseas, such as dock strikes and congested ports (especially in the developing countries), and thus larger stocks may have to be maintained at overseas sales and service outlets than would otherwise be necessary. Finally, the more complex the transport modes the greater the opportunity for damage, pilferage and delay, and also the better the packaging required. The accessibility of overseas markets was found to be a factor influencing the exporting success of firms in the machine tool industry in a study carried out by the P.E. Consulting Group (Tookey, 1975), while in their study of 281 U.K. exporting firms Industrial Marketing Research Ltd. (IMR) found that 'communications' and 'delivery delays' were considered to be the two greatest problems with respect to exporting.

This evidence suggests that perhaps the first target for many U.K. offshore suppliers should be the other sectors of the North Sea. However, with respect to Norway, for example, U.K. exporters still have to overcome the aforementioned problem of protectionist government policies, while even with respect to other sectors of the North Sea they will not really have the advantage of proximity to the market which leads to orders for general services and onshore work such as provision of warehousing. Proximity to the market is, of course, vitally important to wholly-involved service companies such as drilling contractors, support bases and specialised oil services¹³ and thus these firms will probably have to undertake direct investment in the main centres of oil activity overseas if they are to exploit offshore markets worldwide.

Exporters also face currency fluctuation risks in periods of fluctuating exchange rates (Heymann, 1975; Livingstone, 1976). In addition, they may experience difficulty in collecting payment. This may be due to restrictions implemented by the government of an importing country in an attempt to conserve foreign exchange for the purchase of 'essential' imports (Cooper et al, 1970; Tookey, 1975; Deschampsneufs, 1967; Alexandrides & Moschis, 1977). Some countries (such as China) which are worried about their limited foreign exchange reserves are increasing pressure on the major exporting nations to step up their imports from the countries to which they are exporting. However, most western governments

13. This can be seen from the fact that over 80% of the employment created in Scotland by wholly-involved, non-manufacturing companies is concentrated in the Grampian region - see Table 4.5.

are against reciprocal trading agreements of any kind as they are difficult to negotiate and implement, while there may also be a conflict of interest between the exporter and other parties in the exporting country who feel that their business will be adversely affected by the counter-trade imported goods. Nevertheless, trading with some countries requires reciprocal trading to be accepted as one of the 'rules of the game'.

Traditional supply links may also make some areas more promising than others. For example, given the strong trade links between the U.S.A. and South America, it may be difficult for U.K. firms to combat the entrenched positions of U.S. companies in these markets. In 1969 the Economist Intelligence Unit found a strong relationship between the scale and direction of a country's aid and the volume of its exports to the recipient country, with a higher proportion of the aid actually being spent on purchases of goods and services from donor countries than was formally tied to such purchases (Tookey, 1975). Evidence suggests that foreign aid is becoming increasingly important in the battle for overseas contracts, but unfortunately it appears that many U.K. companies are unaware of the funds available to them (Hughes, 1978).

Several studies have shown a clear relationship between the nature of the product and the percentage of total sales exported with, for example, quality, high-priced goods having a greater export potential than bulky, weighty or low-priced goods (Tookey, 1964; Cooper et al, 1970). Export potential may also be associated with the nature of the market - for example, the importance assigned to price relative to style, delivery etc. Cooper et al (1970) found that in the pottery industry the greater the importance assigned to price the lower is the export potential, *ceteris paribus*.

Companies may also be unable to fully exploit export markets due to their inability to increase production because of a shortage of labour, land, raw materials or finance¹⁴ (Cooper et al, 1970; ITI Research, 1979). In this respect larger firms may hold an advantage over small firms which may not have the resources to be successful in export markets (Kotler, 1972). For example, in his study of the hosiery and knitwear industry

14. Finance may be required to make additions either to production capacity or to working capital to finance export transactions.

Tookey (1964) found that larger firms were likely to be more successful in export markets¹⁵ and that this was probably because their greater resources enabled them to offer the longer periods of credit required by overseas customers, undertake market research, employ and train specialist staff etc. (although small firms may be able to overcome some of these problems by using the export services provided by various organisations¹⁶ or by joining together with other manufacturers of similar but non-competing products to share the cost of export marketing operations). Cooper et al (1970) also found that larger firms in the pedal cycle, motor cycle and domestic appliance industries exported a higher proportion of their output, and although no clear relationship was apparent in the office machinery and pottery industries, in the latter there was evidence that the export marketing activities of small firms were restricted by a lack of resources. In the national study undertaken by P.E.P. (1965), 40% of the firms in the size range 1000-2000 exported more than 25% of their turnover, compared with only 19% of those in the 100 - 500 size range and 10% of those under 100. Finally, Hirsch's study (1971) of firms in Denmark, Holland and Israel showed that in all three countries small firms tended to export a smaller percentage of their sales than larger firms and suggested that this might be because larger firms were better equipped to assume the additional risks involved in operating outside the domestic market.

Thus, the attitude which a firm's management adopts towards exporting will depend not only upon its perception of future market trends and the benefits of, and problems associated with exporting, but also upon the firm's size (and hence its resources and capabilities) and the nature of its products.

5.4 THE SIGNIFICANCE OF MANAGERIAL ATTITUDE TO EXPORTING

In the previous section, larger firms were found to export a higher proportion of turnover than smaller firms, apparently because they had the resources required to be successful in export markets. In fact, successful exporting requires commitment in terms of production capacity; marketing mix¹⁷ (and its adaptation to meet the needs of

15. Exporting success was measured in terms of percentage of total turnover exported.

16. These services are discussed in section 5.4 below and also in Appendix 5.1.

17. This term is explained on p.104 below.

overseas customers); increased administration and the employment of specialist staff. However, these resources will not be committed to exporting unless senior management executives adopt a positive attitude towards exporting and decide upon a systematic exporting policy.

Tookey (1964) found that a positive, sensible attitude towards exporting - actively seeking orders and systematically selecting those that could be filled profitably - was the most successful and profitable approach. However, a company's export policy may range from a policy of actively seeking any export order to the ad hoc filling of any export order which happens to come in. In fact, Tookey (1964) found that few firms had an explicit strategy with respect to exporting and even fewer adopted a positive export policy. For example, although 21 out of 32 respondents claimed to be following a policy of unqualified expansion of exports, few were in fact using marketing methods which would achieve this objective.

A failure to commit the necessary resources to exporting was also discovered in the IMR study (1978, p.vii), which concluded that "throughout the research findings there is evidence to suggest that resources for export marketing may frequently be inadequate". For example, in over 50% of the exporting companies surveyed only 10% or less of the total sales staff worked on exports. Moreover, in many exporting firms, less than 25% of the 'export sales staff' were fully engaged on export work. Thus, only a small proportion of total sales effort was being directed towards the export market. Indeed, it is not uncommon for companies to deploy far less resources in export markets than in domestic markets even though these companies believe the export potential for their products overseas (even in the short-term) exceeds that in the home market (Duguid & Jaques, 1971).

The U.K.'s major international competitors may, however, be more willing to commit resources to exporting. ITI Research (Export, Jan/Feb 1979) found that large U.K. exporting companies employed fewer staff in their export departments than did their West German and French counterparts (while the opposite was true in their home sales departments) and concluded that in U.K. exporting companies there were too many people employed on the home front and too few on exporting. Moreover, less training of export staff was undertaken in the U.K.

than in France and West Germany. Approximately 50% of the U.K. exporters surveyed by IMR (1978) gave some kind of training to export sales staff, with larger companies undertaking more special training than smaller companies which felt less able to invest resources in this area. Tookey (1964) found that only 8 out of 54 hosiery and knitwear manufacturers had sent staff to export training courses and that the lack of trained staff was a handicap to some firms' exporting performance. For example, staff were not trained sufficiently to enable them to seek out and analyse marketing intelligence. Similar findings have been made in the U.S.A. (Alexandrides & Moschis, 1977).

IMR (1978) also found that only one-third of the U.K. companies exporting to the E.E.C. used the language of the country to which they were exporting during negotiations and, despite Yarker's statement (1976, p.23) that "lack of languages has never lost me export orders", the British Overseas Trade Board's (BOTB) Languages Study Group (BOTB, 1979b) has emphasised the need for U.K. firms to review their policy on language training and so become more effective in selling overseas. The BOTB report points out that many of the U.K.'s major competitors attach much greater importance to language skills than most U.K. companies. Indeed, competitors often regard knowledge of the language and culture of their customers as fundamental to exporting success, in contrast to the U.K. attitude that language ability is merely a bonus. While lack of language ability is liable to be particularly important when direct selling is undertaken, as in industrial markets, many firms in non-English speaking countries give preference to firms able to deal in the local language (BOTB, 1979b). Thus, the BOTB report stresses that success in export markets cannot be expected without knowledge of the local language, recommends that export staff should be able to speak and understand another major European language and points out that U.K. companies are not even making adequate use of the language training facilities available in this country.

Resources must also be made available to motivate export marketing staff to perform their tasks with maximum efficiency. However, ITI Research (Export, Jan/Feb 1979) found that adequate incentives were

not offered in the U.K., partly due to the levels of taxation in this country. U.K. export managers were found to 'enjoy' a reward, after tax, of about only one-third of the incomes of their French and West German counterparts, a fact which has also been stressed by Yarker (1976). Indeed, in the U.K. the status and rewards offered for jobs on the export sales team may be less than those for domestic sales positions, even though export work is more difficult.

Firms which do not have adequate resources to efficiently develop export markets may be able to overcome some of the export problems this creates by utilising the export services provided by the government, banks, trade associations, chambers of commerce and other similar bodies. In this respect, Tookey (1975) argues that the services offered by the BOTB are particularly useful for new exporters and smaller firms and, indeed, the BOTB tends to concentrate on supporting the exporting efforts of small and medium-sized companies, since the larger firms are usually more experienced overseas and hence are more able to do without the kind of services provided by the BOTB (Gray, 1979a).¹⁸ It is therefore perhaps surprising that IMR (1978) found that small exporters made less use of government services than did larger companies. In fact, evidence suggests that the BOTB's services are not fully utilised. In both the ITI study and Tookey's study of the hosiery and knitwear industry 30% of the firms surveyed claimed to make no use of the BOTB's export services (Gray, 1979a; Tookey, 1964), while roughly 50% of the firms surveyed by P.E.P. (1964) failed to use the BOTB services. It seems therefore that there may be a 'communications gap' and that the BOTB need to increase publicity of their services (Gray, 1979a; Tookey, 1964). The performance of U.K. exporters will be influenced not only by the range of export services provided, but also by their effectiveness. Both IMR (1978) and Tookey (1964) found that the government services were generally highly regarded by exporters, while ITI found that the export services provided by the BOTB were considered to be more helpful by U.K. industry than those offered in France and West Germany (Gray, 1979a).

18. The range of services provided by the BOTB to exporters is discussed in Appendix 5.1.

5.5 CONCLUSION

It was argued in section 5.2 that it may be possible to maintain offshore-related employment in Scotland at its present levels if manufacturers react positively to the decline in the domestic market by deciding to export their offshore-related equipment to overseas markets. Section 5.3 was devoted to an examination of the factors likely to influence managerial attitude to exporting. There appear to be six major groups of factors which might influence management's attitude to exporting and hence its export aims:

- (1) management's perception of future trends in both the domestic and export markets.
- (2) management's perception of the benefits of, and reasons for exporting (which, in turn, will partly depend upon corporate objectives).
- (3) management's perception of the problems associated with exporting
- (4) product characteristics
- (5) firm characteristics
- (6) previous export performance.

As far as future market trends are concerned, the majority of the evidence discussed suggests that export markets are usually regarded as being less profitable than the domestic market and that this relative unprofitability may deter firms from exporting. A firm may therefore often be content to operate in its domestic environment until such time as the operation of some constraint in the domestic market is perceived by its management as a threat to its future growth or even long-term survival. It is often only at this point that a firm may consider taking advantage of profitable opportunities that exist in overseas markets.

Thus exporting may be seen as a way of achieving a greater sales volume than would have been possible solely in the domestic market - and in this way the benefits which a firm's management expects to derive from exporting may be influenced by its perception of future market trends. Apart from growth, most firms appear to regard the opportunity to spread risk as the most important of the many benefits which they may expect to reap from exporting. In addition to these benefits,

manufacturers of offshore-related equipment may wish to export to utilise a comparative advantage which they may hold as a result of their involvement in the North Sea. In many cases, rather than a technological advantage resulting from operating in the harsh environment of the North Sea, the comparative advantage may simply be based on 5 - 10 years experience of marketing products and services to the offshore oil industry. Although management's attitude to exporting may be influenced by its perception of the benefits of exporting this, in turn, will depend upon corporate objectives.

Management's attitude to exporting may also be shaped by its perception of the range and severity of the problems associated with exporting its products. Evidence from studies undertaken in other industries indicates that in addition to the assumed relative unprofitability of exporting, the most serious export problems are usually presented by protectionist measures (particularly tariffs and domestic content regulations) and transportation difficulties. The significance which management attaches to the exporting problems it identifies may in turn be influenced by its view of future market trends. For example, a vigorous effort to surmount considerable export problems may be made by a firm which believes that the domestic market for its product(s) is in long-term decline. Both the size of the problems associated with exporting and also the importance assigned to them may depend upon the resources of the firm. For example, the management of a firm experienced in exporting may have far less difficulty overcoming and be far less concerned about the export-related problems it faces than an inexperienced firm facing identical problems.

Management's attitude to exporting may also be influenced directly by the capabilities and resources it knows it has at its disposal.¹⁹ Indeed, management may even be aware of the research evidence which suggests that larger firms may have an advantage over smaller firms in that they have the resources required to achieve exporting success. The nature of the product may also influence management's attitude to exporting through its impact on management's perception of future market trends, the benefits of exporting and the problems associated with exporting. For example, manufacturers of basic offshore fabrications may be less enthusiastic about exporting than manufacturers

19. For which size of firm is often used as a proxy measurement.

of specialised offshore equipment because they perceive the problems associated with exporting their range of products as being far more severe. Certainly it would appear that exporting sophisticated, offshore-related equipment should generally present fewest problems - for example, specialised oil equipment may be exempted from tariffs.

Finally, in those firms which have exporting experience, management's attitude towards exporting is likely to be influenced by the relative success or failure of that previous experience. This 'feedback influence' is shown as a broken line in Figure 5.1, which is a simplified diagrammatic representation of the determinants of managerial attitude to exporting and the influence that this factor in turn exerts upon export performance.

As explained in section 5.4, the attitude which a firm's management adopts with respect to exporting will have a considerable impact on whether resources are committed to exporting, which in turn will be an important determinant of export performance. However, Figure 5.1 also indicates that export performance may be influenced by the utilisation of the export services provided by the BOTB, banks, trade associations and other external organisations. In particular, small firms which have neither exporting experience nor substantial resources available for export market development may nevertheless achieve some success in export markets through utilising these services.

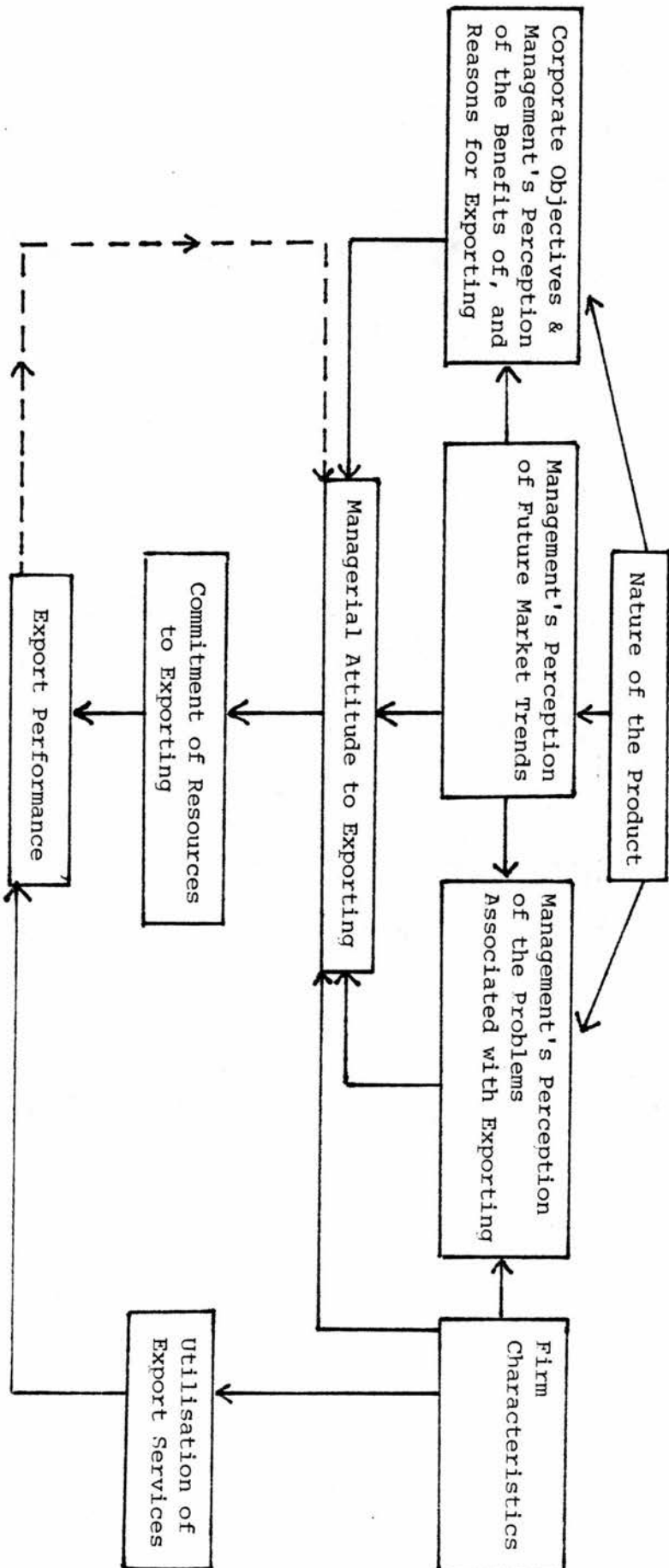
Thus, it must be hoped that offshore-related manufacturers will adopt a positive attitude to exporting and therefore be willing to commit to exporting the resources necessary for success in overseas markets as ...

"... there appears to be a close association between companies' investment in export activity and their export performance" (IMR, 1978, p.vi).

However, it does not necessarily follow that a high level of investment in export activity results in improved performance (and that therefore the achievements of U.K. exporters are largely the result of their own initiatives). In fact, the converse may be the case - investment in export activity may have been more a reflection than a determinant of export performance (and thus improved export performance

FIGURE 5.1

Major Factors Influencing Managerial Attitude to Exporting and their Influence on Export Performance



resulting perhaps from inherent advantages, may have generated further commitment to exporting) (IMR, 1978, p.vii).

C H A P T E R S I X

EXPORT MARKETING METHODS

6.1 INTRODUCTION

It was argued in Chapter 5 that it is vital that a firm's management adopts a positive attitude to exporting as otherwise the resources necessary for successful exporting will not be committed. This chapter follows on naturally from the previous chapter in that it is concerned with the utilisation of these resources in the development of an effective export marketing programme.

The following section examines alternative methods of efficiently organising the export function within the exporting company. Section 6.3, which constitutes the major part of this chapter, appraises alternative export marketing methods, with individual subsections being devoted to discussions of the need for the adaptation of marketing methods for export markets, export market selection policy, export marketing research, export pricing, export products, export promotion and export distribution. It will be stressed that the most appropriate export marketing methods will depend to a considerable extent upon the nature of the product and since this thesis is concerned with the export performance of offshore-related equipment manufacturers emphasis will be placed upon the exporting of industrial products.

6.2 ORGANISATION OF THE EXPORTING FUNCTION

The resources devoted to exporting must be efficiently utilised and thus effective marketing organisation is very important. The way in which the exporting function is organised will depend upon a number of factors, one of which may be the ability of the existing marketing organisation (Tookey, 1975). For example, if the existing marketing department lacks staff with experience of international marketing, the decision to enter export markets may well necessitate the hiring of experienced staff, perhaps to form a separate department.

Hirsch (1971) argues that a unit specialising in a given task will

be set up within a firm when the task it must perform is complex enough to warrant the allocation of the resources required. In this respect, the organisation of the exporting function may depend upon the market selection policy utilised¹ as this will partly determine the similarities between domestic and export markets and hence influence the need to hire new staff with experience of business in overseas markets.

However, the major factor influencing the organisation of the exporting function is likely to be the importance and scale of overseas operations. That is, the importance which firms attach to their actual or potential export markets will be reflected in the size, degree of autonomy and relative position on the organisational chart of the unit dealing with them (Hirsch, 1971). When export business represents only a small percentage of total sales, exporting will normally be accommodated within the existing marketing department. Tookey, Lea & McDougall (1967) found that small firms appeared to deliberately combine export and domestic marketing departments because they felt this approach made economical use of staff and made specific decisions on the priority of home and export customers easier, although this approach does require all marketing staff to have a wider range of skills. However, export business may in time become sufficiently important to warrant organisation as a separate department and eventually may even reach a scale where the home/export department organisation is dropped in favour of international divisions handling both domestic and foreign business (Tookey, 1975; Kotler, 1972).

Hirsch (1971) also found that firms with no formal unit dealing with exports had a relatively low export performance (measured in terms of percentage of total sales exported). However, Hirsch emphasises that this does not mean that firms will necessarily improve their export performance by establishing an export department as it was unclear which of the two variables was the 'cause' and which the 'effect'. Hence it may be that firms exporting a high proportion of turnover simply consider the establishment of an export department justified.

1. Export market selection is discussed in section 6.3.2 below.

6.3 EXPORT MARKETING METHODS

Exporting is merely a special case of marketing² and basic marketing principles are equally applicable to the exploitation of export markets as they are to the domestic market. Differences do arise in the exporting situation as a result of the separation - in terms of geographical distance, economics, culture, language and politics - of the producer and the consumer, and these necessitate considerable adjustment of the marketing programme implemented (Kotler, 1972; Duguid & Jaques, 1971; Deschampsneufs, 1967; Alexandrides & Moschis, 1977; PEP, 1965). Indeed, export marketing is more complex, more costly, more uncertain and more influenced by political factors (Tookey, 1975; Holton, 1969). Nevertheless, export marketing does not require the formulation of new principles and techniques, merely the ability to vary the application of these according to the local conditions in overseas markets.

6.3.1 Adaptation of the Marketing Mix³

A firm's willingness to adapt its marketing mix - in accordance with differences that exist between domestic and export market conditions - provides an indication of the attitude of its management towards exporting, in that it is those firms which fail to adopt a positive export policy (seeing export orders as 'extras' to be filled if and when they come in) that are likely to attempt a standardised approach (Majaro, 1977). A firm which adopts this approach will try to develop a single marketing programme that will appeal to the largest number of buyers possible, relying on mass advertising media to endow the product with a superior image in the minds of the buyers, that is, to differentiate its product from those of its competitors. The objective of this strategy is cost minimisation (since adaptation generally involves increased cost) and control maximisation (as standardisation makes monitoring performance and decision-making easier).

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2. There are many definitions of marketing. Kotler (1972, p.17) defines the marketing concept as "a customer orientation backed by integrated marketing aimed at generating customer satisfaction as the key to satisfying organisational goals." However, evidence suggests that, generally speaking, industrial goods manufacturers in the U.K. are less customer-orientated than consumer product organisations (Deschampsneufs, 1967; IMR, 1978; Hill & Hillier, 1977).
 3. Kotler (1972, p.44) defines the 'marketing mix' as "the settings of the firm's marketing decision variables at a particular point in time". Kotler argues that there are four variables which must be combined in the marketing mix - price, promotion, place and product - to which the author would add a fifth, research.

However, a totally standardised international marketing mix is an elusive goal (Majaro, 1977) and, in any case, although cost effective, standardisation leads to marketing rigidity and hence cost minimisation need not necessarily result in profit maximisation.⁴

At the other extreme is the strategy of formulating a unique marketing mix to suit the needs of each and every export market whose sales and profit potential warrants this approach.

Between these two extremes lie a number of intermediate strategies requiring varying degrees of adaptation to suit local conditions (Tookey, 1975). For example, markets may be grouped into clusters of countries with similar 'marketing ecologies', for each of which the exporter can then develop a relatively standard marketing mix which may be successful in achieving the desired corporate goals for each national market (Majaro, 1977; Keegan 1972; Hovell & Walters, 1972; Boyd, 1974). Companies using this approach are, in fact, 'segmenting' the world market, that is, they are subdividing the world market into homogenous subsets of markets/customers where any subset can be selected as a target market to be reached with a distinct marketing mix.⁵ The basic advantage of market segmentation is that it necessitates the employment of the marketing concept and focusses attention on consumer needs, leading to a better understanding of the customer and why he buys. Once management understands the needs of the customer it is in a better position to direct marketing programmes that will satisfy these needs. Since it aims at customer satisfaction, adoption of a market segmentation approach should provide the firm with a competitive advantage over firms using a standardised approach and hence should lead to higher total sales. However, market segmentation will also result in higher administration and adaptation costs. Management must therefore relate any modification of the marketing mix to the size and potential of the export market in order to ensure that adaptation is profitable (Alexandrides & Moschis, 1977).

4. Nevertheless, Keegan (1970) suggests that for a firm starting to export there may be good reasons - such as simplicity and cost minimisation - for adopting a uniform market strategy.

5. For a full description of market segmentation, see Kotler (1972), p. 166.

However, it should be noted that export market involvement may not only require adaptation of the marketing mix but also implies, or at least should imply, changes in objectives, policies and organisation for the entire company. For example, the design department may have to develop new styles suitable for export markets and the production department may be involved in the scheduling of special runs, while it has been suggested that integrating the movement of goods into the exporting process rather than thinking about transportation once the order has been secured (or even manufactured) could result in savings of up to 10% on the transportation costs of exports (Hughes, 1979b). Thus, for maximum efficiency it is vital that all company departments are 'educated' to think about the export customer as well as the domestic customer.

6.3.2 Export Market Selection

The extent to which adaptation of the marketing mix is necessary will depend partly upon the market selection policy utilised. Assuming that the chances of loss in different markets are independent, by becoming established in a number of markets a firm can reduce the risk it faces. However, foreign market entry requires investment and this investment will be lost in those markets which turn out to be unprofitable. Moreover, a given investment in marketing resources may well yield a higher total return when it is concentrated in a small number of markets than when the effort is spread thinly over several markets. Thus, there is a trade-off between risk-spreading and expected profitability, and the choice which a firm makes will depend upon the resources it has, its risk-preferences, etc. (Hirsch, 1971).

Evidence suggests that U.K. companies attempt to develop a greater number of markets than is advisable given their limited resources. For example, ITI Research (Export, Jan/Feb, 1979) found that French and West German companies tend to concentrate on fewer markets than U.K. exporting firms and concluded that this policy lead to a better understanding of market conditions, reduced overheads and increased managerial efficiency. IMR (1978) found that although the number of export markets served clearly increased with size, 50% of the U.K. exporters surveyed with 100 employees or less exported to more than

ten countries, despite the fact that 85% of these companies had six or less export staff, not all of which worked on exports full-time. Moreover, in most companies the trend was towards further dispersal of marketing effort with the penetration of new markets. IMR (1978) concluded that such a wide dispersal of effort raised doubts as to the cost-effectiveness of these firms' marketing effort. Concentration of effort on a few markets is particularly important to small firms with limited resources and firms in the initial stages of exporting, as entering a market with inadequate resources will often lead to an underestimation of the specialised needs of the market, which may prejudice the exporter's long-term stake in that market (Tookey, 1975; Yarker, 1976).

Perhaps the most obvious market selection policy is to choose those markets which offer the greatest potential - that is, those in which the latent demand for a suitable product is greatest given the existing competition - and then adapt the marketing mix to meet the requirements of these markets. However, this may lead to the selection of a geographically dispersed group of markets with diverse requirements, necessitating difficult and costly marketing mix adaptation for each market (Tookey, 1975). In fact, evidence suggests that often 'matching' is the best basis for market selection, that is, firms should select markets which offer adequate potential but which also have similar characteristics to the domestic market, as this will maximise the relevance of previous experience and minimise learning and adaptation costs (Tookey, 1975; Keegan, 1972; Sweeney, 1970). In this way the company concentrates its marketing activity on achieving a strong position in those markets in which its strengths lie, rather than spreading its resources thinly in the development of many markets throughout the world (Majaro, 1977).⁶

6.3.3 Export Marketing Research

Up-to-date marketing information is a key feature of the marketing approach (Duguid & Jaques, 1971). Evidence of the importance of adequate information is provided by the IMR (1978) study which found that the most important factors influencing exporters' choice of markets were 'good knowledge of local market conditions' and 'favourable market conditions' (which presupposes the availability of reliable information about these markets).

6. Kotler (1972, pp.185-187) provides a more detailed discussion of the benefits of 'concentrated marketing'.

Although 'desk research' (of published information) may be adequate for preliminary screening of export markets, planning of marketing operations will require direct contact with the market and systematic investigations (Majaro, 1977; Day, 1976). Indeed, ITI Research (1979), Tookey (1975) and Wainwright (1971) believe it is essential to either undertake or commission first-hand research. This research may, in fact, be carried out by a domestic agency which specialises in conducting market surveys of overseas markets, an overseas research agency (which may have first-hand knowledge of the country under investigation), the company itself (using its own resources and having the advantage of familiarity with the products to be exported), or a combination of these, the choice depending upon several factors such as the relative costs of the various approaches (Alexandrides & Moschis, 1977; Day, 1976; Cranch, 1974). Moreover, marketing information should be continuously up-dated as the marketing environment will change over time and hence marketing strategy may have to be revised (Tookey, 1975; Godley & Cracknell, 1971; Wainwright, 1971).

However, evidence suggests that U.K. industry is heavily dependent on published information concerning export markets, particularly small firms which find marketing research an extremely expensive activity (MacKay, 1964). Both the IMR (1978) study and Tookey's (1964) study of the hosiery and knitwear industry revealed very little use of marketing research organisations, the main source of export information in both surveys being the export services of the BOTB⁷ and feedback from salesmen and agents overseas, although trade associations, chambers of commerce and banks are also important sources of information (IMR, 1978; Burgess, 1970; Alexandrides & Moschis, 1977; McMillan & Paulden, 1974). Several surveys undertaken in the U.S.A. have shown that lack of information about overseas markets is, in fact, the main obstacle to export expansion in that it causes firms to underestimate export potential (Alexandrides & Moschis, 1977).

In general, in any country the market for industrial products will consist of a much smaller number of buyers than exists for consumer goods. A large proportion of the demand for offshore-related equipment in any particular market will emanate from the major international oil companies, drilling contractors, project managers and state oil company, where one exists. However, as has already been explained,⁸

7. See Appendix 5.1 for further details.

8. See p.33.

it may nevertheless prove extremely difficult to identify the location of purchasing authority in industrial markets in general and in the offshore market in particular. Given the importance of directing marketing activity at those people which exert most influence in the purchasing process, it is vital that Scottish offshore-related manufacturers make direct contact with the operating companies, drilling companies etc. active in overseas markets.

While the main responsibility for assessing offshore markets overseas must rest with the offshore-related manufacturers themselves, the OSO devotes some of its resources to the identification of overseas opportunities. The OSO acts as a general agency within government for the collection and evaluation of information concerning major offshore developments overseas - leaving the BOTB's Export Intelligence Service (EIS) to handle the information flow about smaller contracts⁹ - and also works closely with professional and trade associations such as ABOI and CBMPE. The OSO's aim is to be able to advise on the probable nature, scale and timing of major offshore projects overseas; the organisations that will make the major buying decisions and the key personnel involved; and the domestic supply of offshore-related goods and services in the countries where the developments are taking place. Having in this way identified opportunities for U.K. participation the OSO works closely with the Overseas Project Group of the BOTB (which has experience in the pursuit of contracts for large projects and can offer financial assistance to consortia and main contractors)¹⁰ to provide assistance and advice to enable U.K. companies to mount an effective response (Department of Energy, 1977).

6.3.4 Export Pricing

Decisions must be taken with respect to the basic price, credit and payment terms, margin policy and transport terms to be offered to export customers.

Pricing a product in export markets is extremely complex due to the large number of variables that must be taken into consideration. Firstly, the internal cost structure of the product must be assessed. The production costs taken into account may be full or variable costs

9. See Appendix 5.1 for further details.

10. See the section concerning Capital Goods Projects in Appendix 5.1.

depending upon the company's strategy towards export markets. For example, if exporting is being undertaken merely to maintain full production capacity it would be appropriate to take variable costs into consideration. However, if the commitment to exporting has involved extra capital investment this must be taken into account. A unit cost of production will be arrived at by adding any modification costs to these production costs, while other cost elements which may be considered include shipping costs (including transportation, administration and insurance costs), tariffs, taxes, middlemen's margins and a contingency element for exchange rate fluctuation and other financial risks. Once these various cost components have been assessed, the external factors likely to affect the product's sales - such as competitive prices and the product's estimated demand schedule - must be analysed before the final price is fixed (Alexandrides & Moschis, 1977).

The practice of having one common price for all markets is more likely to be wrong than correct in any particular market. Evidence suggests that most firms' ex-works export prices are different from (and usually lower than) ex-works domestic prices (P.E.P., 1965; Duguid & Jaques, 1971; Cooper et al, 1970; MacKay, 1964; Hirsch, 1971). Nevertheless, several studies have revealed that many U.K. companies experience difficulty in meeting overseas competition. For example, price competition - from both local manufacturers and imports from other foreign countries - was identified as the second greatest hindrance to exports in the P.E.P. (1964) study and the greatest difficulty encountered in export markets in the Scottish survey undertaken by MacKay (1964). Similarly, IMR (1978) found that more U.K. companies considered themselves to be at a competitive disadvantage with respect to price than with any other factor. The significance of this competitive disadvantage can be seen from the fact that the studies by both IMR (1978) and Hirsch (1971) revealed that exporters believed price to be the most important factor determining success or failure in export markets.

The international competitiveness of U.K. industry depends partly upon the rate of inflation and the rate of productivity growth, in which areas the U.K. has fared worse than its major international competitors in recent years. These factors should result in a fall

in the value of sterling, but instead, until the early part of 1981 the pound was strong (reflecting the U.K.'s oil resources and high interest rates) and hence itself adversely affected the international competitiveness of U.K. manufacturers.

Credit is an important aspect of the 'price mix', and adequate credit accommodation is one of the major factors which an exporter's prospective customers will take into consideration. Indeed, because of balance of payments pressures, foreign exchange controls and high interest rates, the importer may be more interested in the credit terms offered - and also the currency in which payment is to be made - than the actual price (Robinson, 1969). It is therefore vital that the credit policy established meets the needs of the customer and compares favourably with the terms offered by competitors (BOTB, 1978; Robinson, 1969; Benedict, 1979; Hughes, 1979a). Often customs will prevail in a particular market or country as to the credit terms which customers believe they have the right to expect with, for example, longer periods of credit being expected in industrial equipment markets (Hirsch, 1971; Day, 1976).

The credit to be provided will be one of the terms of payment agreed upon by the importer and exporter. Although cash in advance offers the exporter the highest degree of security, this method of payment places a heavy burden upon the importer and therefore is seldom used (Alexandrides & Moschis, 1977). The export letter of credit also offers considerable protection to the exporter. The letter of credit will be opened by the importer through a local bank upon completion of the sales contract. The importer's bank will then request an associated bank in the exporter's country to inform the exporter that a letter of credit has been opened in his favour. Usually this arrangement will be irrevocable, which means that the exporter is guaranteed payment (in his own currency) on presentation of the shipping documents to the local bank which confirmed his letter of credit. From the point of view of foreign customers letters of credit are, however, costly (since the buyer must pay bank fees and deposit funds in his own bank well before receipt of either documents or merchandise), time consuming and irksome (Benedict, 1969; Deschampsneufs, 1967; Alexandrides & Moschis, 1977). In contrast, sales on open account offer the least protection to the exporter as this method provides

no tangible proof of the importer's obligation to pay. However, this method is simple in that it requires little or no documentation and no bank fees, and is therefore often used for sales to familiar customers in stable countries. However, many exporters quote their terms of payment as 'cash against documents', which means in effect that the exporter will release the documents - the title to the goods - against payment or a promise to pay on a certain date (depending upon the credit period the exporter has agreed to extend to the importer). This method involves the exporter, through his bank, drawing on his overseas customer a bill of exchange for the due amount.

The Export Credits Guarantee Department (ECGD) insures exporters, at a reasonable cost, against any loss arising from the failure of overseas customers to pay for goods.¹¹ Insured against the risk of non-payment, exporters should in theory be able to pursue bolder marketing policies, taking on new buyers and breaking into new markets without fear of heavy losses (ECGD, 1977; Brown, 1979).

Providing that the importer is credit worthy and the importing country stable, commercial banks will normally assume the credit and political risks involved in export financing. However, in more difficult cases the exporter may assign his rights under an ECGD insurance policy to his bank, or make use of the loan guarantee schemes provided by the ECGD which enable commercial banks to undertake high risk export financing (ECGD, 1977; Alexandrides & Moschis, 1977; Day, 1976).¹² In this way, the ECGD's guarantee support for export finance enhances an exporter's liquidity, helping him to offer competitive terms and win contracts he might otherwise lose (ECGD, 1977; Brown, 1979). Given that some developing countries may be unable to achieve their desired rate of offshore development due to a shortage of funds,¹³ the ECGD's guarantees for buyer and supplier credit financing may be particularly important with respect to U.K. oil-related exports to these countries. For example, in September 1978 the ECGD backed a \$50 million loan to Pemex of Mexico for the purchase of U.K. plant and equipment for the oil, gas, refining and petrochemical industries, and in June 1978 and August 1979 guaranteed \$35 million loans to Petrobras (of Brazil) to help finance contracts awarded to U.K. suppliers of capital goods for the oil and petrochemical industries.

11. Appendix 5.1 provides a more detailed explanation of the insurance cover offered by the ECGD.

12. For more detail of the ECGD's guarantees for credit financing see Appendix 5.1

13. See p.111.

6.3.5 Export Products

The determination of the product element of the export marketing mix necessitates decisions being taken with respect to the design, quality, branding, packaging, servicing and range of products to be exported.

The U.K. exporters surveyed by IMR (1978) regarded product quality and expertise to be the second most important factor for success in export markets and considered this factor to be that in which they held their biggest competitive advantage. However, only 30% of these exporters claimed to design and develop products specifically for the export market, the rest developing products initially for the home market. Moreover, most products sold overseas are characterised by an almost token degree of adaptation, such as slight modifications to fit technical standards such as voltages (Duguid & Jaques, 1971). Although product adaptation will increase both manufacturing costs (through the loss of economies of scale) and R & D costs, the more adaptive the company is to the foreign market's needs the more likely it is to win a large share of the market (Alexandrides & Moschis, 1977; Keegan, 1970; Tookey, 1964).

The extent to which adaptation is necessary will depend to a large extent upon the nature of the product. In general, industrial products are relatively environmentally insensitive and, in some cases, it may even be possible to design an 'international product' which can be sold in both export and domestic markets in more or less the same form (Deschampsneufs, 1967). Also, industrial goods tend to be either custom-built or produced in batches, so that the 'setting up' costs of adaptation will not be relevant. Moreover, adaptation costs will be minimised if the needs of both the domestic and export markets are considered at the outset in the planning of a new product (Deschampsneufs, 1967). Finally, export marketing costs can be reduced by narrowing the range of products to be exported, perhaps exporting only those products which require minimum face-to-face communication with customers. Hirsch (1971) found that in 17 of the 18 industries studied the product range exported was more restricted than that sold in the domestic market and concluded that concentration on a narrow product range if anything improved export performance as it allowed economies of scale in both production and marketing to be achieved.

Nevertheless, as has already been pointed out,¹⁴ techniques and equipment suitable for operations in one set of environmental conditions may be inadequate when subjected to new conditions and equipment designed for use in the North Sea may require adaptation for use in other offshore areas. In particular, as industrial product manufacturers Scottish exporters of offshore-related equipment require to pay special attention to the need to design products for export which reflect the different (often lower) maintenance standards and practices of overseas markets (Keegan, 1970; Deschampsneufs, 1967).

The parallel development of services is a vital part of the product element of the marketing mix of industrial products (P.E.P. 1965; Tookey, 1975). For example, the capital goods manufacturers surveyed by IMR (1978) considered the provision of after-sales services to be the fourth most important factor for success in export markets. Although arrangements may be made for services to be provided by an independent organisation in the export market(s), if the product is custom-made or the training of the employees of a separate organisation is uneconomical, the services may have to be provided by the manufacturer.¹⁵ This may involve him in considerable expenditure on the establishment and running of a local operation, which may not be justified by the size of the market. Indeed, inability to provide services economically may prohibit exports altogether, or at least limit exporting to those products which either do not require servicing or can be serviced by independent organisations in overseas markets. Indeed, Hirsch (1971) found that fewer firms gave their export customers pre-sales services (including technical assistance and instructions about the use of the products purchased) and post-sales services (including repairs and provision of spare parts) than in the domestic market. However, the export performance of those firms which did provide services to foreign customers exceeded that of those that did not (Hirsch, 1971).

6.3.6 Export Promotion

According to Deschampsneufs (1967), promotion is probably the element of overseas marketing most neglected by U.K. manufacturers. Companies may use a combination of advertising, personal selling, sales promotion and public relations to promote their products. The need to adapt the

14. See p.85

15. This subject is discussed further below, pp. 119-120.

'promotional mix' in individual export markets will depend to a large extent upon the product with, for example, a highly technical product normally lending itself to a higher level of promotional standardisation (Majaro, 1977).

The most appropriate methods of promotion will also depend upon the nature of the product (Tookey, 1975).¹⁶ Industrial equipment manufacturers will tend to make more use of personal selling than mass media advertising. This is partly because these manufacturers will normally have a much smaller number of prospective customers than a manufacturer of products for the consumer market, but also because products sold in industrial markets tend to be of a higher value, less standardised and more complex nature and hence are best sold directly by a salesman (Alexandrides & Moschis, 1977). Indeed, Buckner's (1967) study of industrial purchasing in the U.K. revealed that sales engineers are, for industrial purchasers, probably the most important method of obtaining information on products, and that therefore the salesman is the industrial goods manufacturer's key marketing resource. Also, the salesman is in the best position to identify the individuals who exert influence over the purchasing decision and their goals (Webster & Wind, 1972) and should be able to vary his approach in accordance with the various interests of the 'influencers' (Harding, 1966). Thus, a salesman can provide detailed, specific information tailored exactly to satisfy each influencer's needs, in a way which would be impossible through mass media and impersonal sources of information (Webster & Wind, 1972). The exporter who sends representatives overseas will therefore get to know the market and his customers at first hand and gain a better understanding of the way in which his product can be sold there. Moreover, the exporter who has taken the trouble of visiting the buyer's country will be more favourably considered (Tookey, 1978).

It has already been emphasised that industrial purchasing need not be completely rational.¹⁷ For example, an industrial purchaser may be swayed by the image/reputation of a supplier (Harding, 1966; Levitt, 1967; Strauss, 1962). Indeed, Harding (1966) found that the 'image factor' was a powerful influence on industrial buying decisions.

16. Although IMR (1978) did find, rather surprisingly, that there was little significant variation in the use of the most important forms of promotion by firms in the industrial and consumer sectors.

17. See p. 43.

This image factor is not simply a function of previous experience with a supplier but also the result of attitude formation strongly influenced by the reputation a company has among its peers, advertising and the personality and behaviour of visiting salesmen. According to Levitt (1967), the better a company's reputation the better are its chances of obtaining a favourable first hearing for a new product among prospective customers and of achieving early adoption of that product. However, Levitt (1967) found that the favourable influence of a company's general reputation erodes over time. That is, in the absence of repeated sales call-backs or advertisements to reinstate his identity, the seller, over time, will tend to lose the favourable impact of his good reputation. Thus, even in industrial markets, advertising and sales promotion materials can perform the important function of establishing and re-instating the good image/reputation of the seller (Harding, 1966; Levitt, 1967).

In industrial export markets advertising may be used to create awareness of the company and its products and hence provide an environment in which a salesman can work more effectively (Alexandrides & Moschis, 1977; Yarker, 1976). Deschampsneufs (1967) points out that although the technical publications in some local markets may be of limited value, there are a growing number of both general and technical publications of international coverage in which advertising may be worthwhile. Certainly, there are a number of offshore-related publications such as 'Offshore', 'Oil and Gas Journal' and 'Petroleum Engineer' which are internationally read. Although industrial advertising should ideally be based on an appraisal of the characteristics of the buying situation and the composition of the group influencing the buying decision, industrial advertising budgets are usually too small to allow different appeals to be made to the various people wielding buying influence (Harding, 1966).

Deschampsneufs (1967) considers the provision of sales literature - such as brochures, leaflets, specification sheets and catalogues listing products available for sale overseas - to be the first essential in terms of overseas promotion, and direct mail shots (which are designed to provide leads for salesmen and can be directed at several people in each organisation) to be a particularly useful sales weapon provided they are followed up quickly.

However, the study carried out by the P.E. Consulting Group (1970) revealed that purchasers of machine tools regarded exhibitions as being more important than sales literature and advertising. Exhibitions and trade fairs can be particularly useful for the introduction of new industrial goods, while they also provide the exporter with an opportunity to observe the competition and make and/or maintain contact with agents and buyers (Alexandrides & Moschis, 1977; Yarker, 1976; P.E.P., 1965; BOTB, 1978). However, the value of participating at trade fairs is frequently questioned as any order engendered by initial contact made at a trade fair may not materialise for up to two years. Also, exhibiting is expensive and offshore-related manufacturers must be selective. They must consider, for example, whether they would be better not to take advantage of the BOTB's assistance at general British Industrial Exhibitions (such as those held in Mexico in 1978 and China in 1979) in order to concentrate on the more specialised offshore exhibitions, at which they can also benefit from BOTB support.¹⁸ In fact, U.K. offshore-related manufacturers are always well represented at international offshore exhibitions, the most important of which is the annual exhibition at Houston, at which U.K. companies form the largest overseas delegation - at the 1980 exhibition, for example, the BOTB joint-venture group comprised 162 companies. The OSO is itself always represented at a number of annual international offshore exhibitions, while every year OSO personnel visit a number of overseas countries with offshore prospects in order to give presentations on U.K. offshore capability to senior government officials and oilmen.

6.3.7 Export Distribution¹⁹

Possible methods of distribution include export merchants in the U.K.; buyers for overseas organisations resident in the U.K.; agents and/or distributors in overseas markets; overseas sales representatives (and other staff sent to visit overseas markets); and sales subsidiaries overseas.

Export houses²⁰ have considerable experience in selling overseas and provide a wide range of marketing, finance and shipping services to

18. BOTB support for overseas trade fairs and exhibitions is discussed in Appendix 5.1.

19. In terms of Kotler's terminology, this is the 'place' element of the marketing mix.

20. In the interests of brevity, export finance houses, factors, confirming

the manufacturer. However, they often specialise in the type of services offered, the products handled or the markets covered - in particular, they are stronger in Commonwealth markets and better at exporting consumer products (Tookey, 1975; BOTB, 1978; McMillan & Paulden, 1974). In addition, export houses may be unable to handle after sales service, while use of an export house limits the contact of the exporter with the market and hence restricts his knowledge of the market and his ability to develop his export organisation further. Nevertheless, use of an export house may be appropriate for new exporters (particularly small firms) with a product highly saleable overseas but lacking in marketing skills and knowledge of overseas markets and unwilling to commit substantial resources in the early stages of overseas marketing, or for established exporters in markets where the potential is insufficient to justify the establishment of the firm's own sales organisation (Duguid & Jaques, 1971; Wainwright, 1971).²¹

The distinction drawn between an 'agent' and a 'distributor' may be of a legal nature. Robinson (1973) defines an agent as a local representative who buys nothing from his principal but merely acts on his behalf as defined in an agency agreement, whereas a distributor actually contracts to buy the exporter's goods for sale to third parties, thereby absolving the principal of certain risks and liabilities from that point onwards. However, often the distinction is more one of a functional nature, with the term 'agent' being used to describe a representative who obtains orders on behalf of his principal and sends them home for execution, whereas the 'distributor' holds stock (which he may or may not purchase) from which he delivers.

An agent,²² who will receive commission on sales, is suitable when long-term selling is required to a large number of possible customers. However, when there is likely to be a long period before commission can be earned on a regular basis - as in the launching of a new product -

houses, export managers, export merchants, manufacturer's export agents and buying/indent houses, which are all intermediaries situated in the domestic market offering slightly different export services, have been included under the heading 'export houses'.

21. Similar arguments apply to selling through the U.K. buying offices of overseas governments or foreign firms (Tookey, 1978).

22. Whether defined in a legal or functional sense.

it may be necessary to pay the agent a fee or retainer in addition to commission on sales in order to encourage the agent to expend time and effort on the untried product. A distributor will normally receive commission or profit on sales²³ plus profit on the sales of spares and consumables related to the product (of which he will be expected to keep stocks). Finally, in the case of large items of capital equipment, the local representative may agree to provide installation, maintenance and repair service facilities in return for a fee over and above commission on sales (McMillan & Paulden, 1974).

The employment of a local representative limits the investment committed by the exporting firm and provides detailed knowledge of the market (Tookey, 1975; Day, 1976; Yarker, 1976). However, the interests of the principal and the agent will not be identical, which may be a constant potential source of conflict between the two parties (Duguid & Jaques, 1971). It is therefore important that a precise, formal agreement is concluded between the agent and the exporter as this should help to avoid misunderstandings which might otherwise arise with respect to sales territories, the division of responsibility for selling and other activities, etc. (Wainwright, 1971; Yarker, 1976). Careful training, motivation and management of overseas agents - including regular visits to train personnel and stimulate enthusiasm - is also vitally important, although these are areas often neglected by U.K. exporters (McMillan & Paulden, 1974; Wainwright, 1971; Duguid & Jaques, 1971; Godley & Cracknell, 1971). Finding a good agent may also prove extremely difficult, although useful help in the selection of agents can be sought from banks, chambers of commerce, trade associations and the BOTB (McMillan & Paulden, 1974; P.E.P., 1965; Schmitthoff, 1979; BOTB, 1978).²⁴

The use of salaried salesmen in overseas markets opens up a vitally important direct personal link with the customer. However, the salesmen may not know the local customs, market etc. as well as a local agent, while the firm will also be required to provide a fuller range of export services (Tookey, 1975; Duguid & Jaques, 1971; Alexandrides & Moschis, 1977).

Finally, the establishment of a marketing or sales subsidiary overseas provides a base for carrying stock and providing spares and after-sales

23. Depending upon whether the distributor purchases the goods or merely stocks them for the principal.

24. Details of the BOTB's agency finding service are provided in Appendix 5.1.

service, makes it easier for overseas customers to make contact with the firm and improves control over foreign operations.

The choice of distribution channel will depend upon company, market and product considerations. For example, ITI Research (Export, Jan/Feb, 1979) found that no significant differences in methods of overseas operation seemed to exist between companies in the U.K., France and West Germany - differences appeared to be related to size of company, with small firms tending to rely on the use of intermediaries, whereas large firms tend to perform more of the marketing functions themselves. In fact, companies often go through a classical pattern of evolution in distribution (Majaro, 1977; Tookey, 1975). Generally speaking, it is desirable for an exporter to maintain direct control over the product as far down the distribution line as possible as this will put him in a better position to influence the way in which it is marketed (Barling, 1979a). However, when entering international markets for the first time firms normally lack the specialised skills and know-how (and perhaps also the resources) required to control their own channel and therefore prefer to use intermediaries (Majaro, 1977; Robinson, 1969). Eventually, as experience increases, exporters may wish to expand their control over the marketing of their products in overseas markets and may even establish subsidiaries in those markets which justify this level of commitment.

Most companies do, however, use more than one type of distribution channel at any one time in different markets depending, for example, on their size and growth potential - low sales turnover encourages the use of middlemen so that marketing costs can be shared (Tookey, 1964; Wainwright, 1971). The larger the typical order size or the greater the geographical concentration of customers the more likely is the use of the company's own sales representatives since it becomes more economical to use full-time employees (Alexandrides & Moschis, 1977; Duguid & Jaques, 1971). Also, in some countries it is politically advisable or even essential to have a man on the spot (Yarker, 1976). Finally, channel selection will be influenced by traditional marketing practices in particular overseas markets (Majaro, 1977).

Product characteristics will also influence the choice of distribution channel. Industrial products are often custom-made and as such are

normally sold direct by sales representatives (IMR, 1978). If the products are technically complex or if technical consultation on design is required the best results will be achieved if the firm's own personnel conduct the negotiations, as agents may not be technically competent (Majaro, 1977; McMillan & Paulden, 1974; Alexandrides & Moschis, 1977). Also, many industrial customers prefer to deal direct with the principal (Duguid & Jaques, 1971). However, if installation, operative training or after-sales service is required a local representative of some kind will probably be necessary (Deschampsneufs, 1967). For example, P.E.P. (1965) found that in the machine-tool and earth-moving equipment industries it was essential that manufacturers had local representatives able to give prompt service to overseas customers. Thus, although selling (particularly in industrial markets) will often be undertaken by the manufacturer's own personnel, local agents may nevertheless be employed to provide contacts, languages in negotiations and after-sales services.

6.4 CONCLUSION

Evidence suggests that there is a strong relationship between marketing strategy and export performance. For example, in Table 6.1 below, which summarises some of the results of Tookey's (1964) study of export

TABLE 6.1
Proportion of Total Sales Exported, Compared with Export Methods

% of Total Sales Exported	0-4	5-14	Over 15	All Firms
Percentage of firms replying to questions :-				
Willing to adapt products or packaging	44	63	83	61
Advertising in overseas markets	8	29	62	29
Having overseas subsidiaries or employing export sales reps.	5	16	36	21
Staff visiting overseas markets	68	74	86	73
Using 3 or more export services	31	72	86	62
Using export training courses	10	21	14	15

SOURCE : Tookey (1964), p.63.

performance in the hosiery and knitwear industry, there is an association between the export methods adopted and the percentage of turnover exported. However, it is not possible from these results to establish whether firms export more because they use these methods, or whether these methods are merely a necessary part of large-scale exporting (Tookey, 1964).²⁵

Nevertheless, it is obviously essential that the marketing mix formulated for export markets satisfies the needs of prospective customers. As in the domestic market, it is vital that offshore-related manufacturers identify the location of purchasing authority in each of the (relatively small number of) major prospective customer organisations in each market in order that marketing activity can be directed at those individuals who exert most influence in the form which is most likely to have the desired effect upon them. Normally offshore-related manufacturers will find that the most effective means of communication with prospective customers will be the salesman, since he will be in the best position to distinguish the identity and goals of the purchasing 'influencers' and should be able to adapt his approach in response to their various interests (in a way which would be more difficult, or perhaps even impossible, using other media). A salesman will also be able to provide the detailed information (concerning what may be a technologically-sophisticated product) which an agent may not be competent to deliver. A local agent may nevertheless be employed to provide the prompt after-sales service considered essential by the oil industry in those offshore areas overseas where it is not feasible for offshore-related manufacturers to establish their own service facilities. While industrial purchasing decisions are largely based on rational criteria such as price, credit terms and product quality, 'irrational' factors such as a supplier's reputation can also influence the patronage decision. In the formulation of a company's general reputation an important role is played by industrial advertising, exhibitions, mail shots (and other promotion material) and particularly previous experience. In this respect the previous North Sea experience of Scottish offshore-related manufacturers may prove an important comparative advantage.

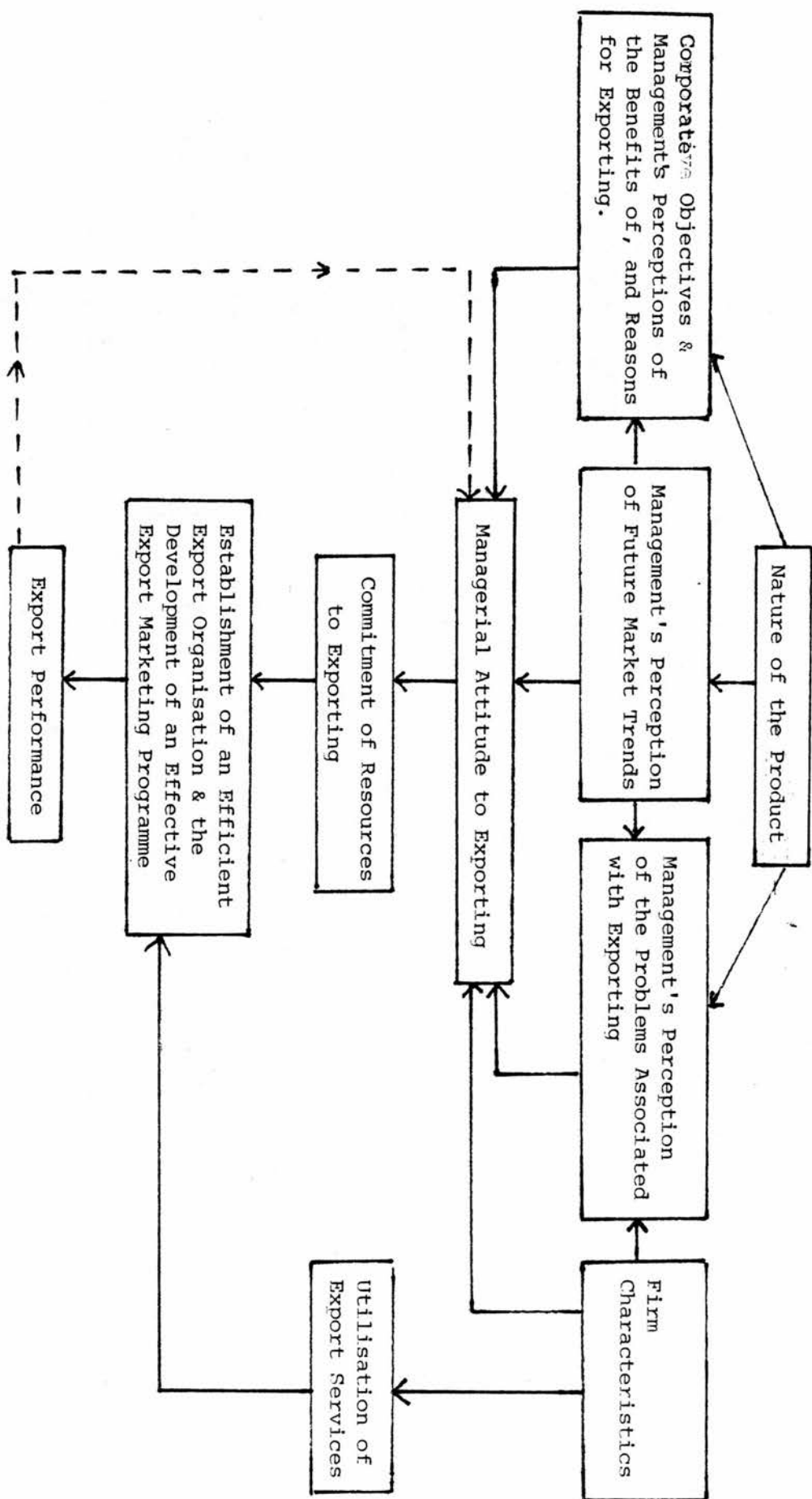
25. The direction of this relationship could only really be determined by a detailed, on-going study of the exporting process in individual firms.

The IMR (1978) and ITI Research (1979) studies both found that U.K. firms tend to spread their resources too thinly over a number of export markets. This evidence suggests therefore that offshore-related manufacturers, particularly those exporting for the first time, should concentrate their resources on the development of a small number of key export markets. However, even with the adoption of this 'concentrated marketing' approach, effective export marketing requires commitment of resources, although to a certain extent it may be possible for a firm to limit its investment in exporting by making use of the export services provided by the BOTB and other external organisations, as shown in Figure 6.1 (below), which is a diagrammatic representation of the major factors influencing export performance.

As explained in the previous chapter and as illustrated in Figure 6.1, whether resources are committed to exporting may be determined to a large extent by the attitude which a firm's management adopts with respect to exporting. This attitude may itself be influenced by a number of factors including firm characteristics, product characteristics, previous exporting experience, management's perception of the benefits and problems associated with exporting and expected future trends in both export and domestic markets.

FIGURE 6.1

Major Factors Influencing Export Performance



CHAPTER SEVEN

SURVEY AIMS AND METHODOLOGY

7.1 INTRODUCTION

This chapter is devoted to a discussion of the aims and methodology of each of the three phases of fieldwork. Following a brief explanation (provided in section 7.2) of the desk research carried out prior to the fieldwork, section 7.3 discusses the objectives and survey methods of the first (and main) phase of interviewing. This survey, undertaken with the objective of identifying the major factors influencing the export performance of the Scottish manufacturing sector of the offshore supplies industry, consisted of a series of in-depth, qualitative interviews with the senior executives responsible for determining export strategy in 40 offshore-related manufacturers located in Scotland.

The second phase of interviewing, which consisted of a survey of expert opinion, is described in section 7.4. This survey was carried out in order to develop a scenario - an internally-consistent, plausible account of a future situation - of the global offshore market in the period 1980-85. Finally, the aims and methods employed during the final phase of the fieldwork - which was undertaken with the objective of investigating possible future trends in the exporting activities of Scottish offshore-related manufacturers - are discussed in section 7.5. This phase consisted of a further round of interviews in each of the original sample of offshore-related manufacturers, during the course of which the senior executives were requested to state the expected strategic response of their firms to the market situation as outlined in the scenario developed by the researcher.

7.2 DESK RESEARCH

The desk research phase involved the collation and analysis of published and in some cases unpublished information on the area of study. It was necessary to undertake desk research in three main areas : export marketing literature, the nature of the offshore oil industry and the global offshore market.

Such is the volume of literature on the topic of exporting that the researcher had to be very selective as to the items analysed. In fact, the desk research in this area principally involved the synthesis of previous work on export determination in order to identify informational gaps representing possible areas and methods of study, in this way avoiding duplication of research.

Sound knowledge of world markets for offshore-related equipment was necessary as expected future trends in both export and domestic markets had been identified as significant influences on export marketing policy in previous research studies undertaken in this area (Cooper et al, 1970; Majaro, 1977). In addition, knowledge of the global situation would allow the interviewer to pose the appropriate questions (and probe the resulting answers) and appear informed, encouraging respondents to give considered, genuine responses and thus hopefully improving the quality of the results obtained.

It was necessary to undertake desk research on the nature of the offshore oil industry for the following reasons :

- (1) Interviewers in industrial marketing research must have a sound knowledge of the subject matter to be discussed as otherwise respondents will tend to lose interest in the interview, with the quality of data suffering as a consequence.
- (2) As will be explained below, it was decided not to tape-record the interview. This meant that knowledge of the industry was particularly important since it would be essential that the researcher was capable of assessing quickly the salient points, as not every word spoken could be written down.
- (3) It was evident from previous export marketing studies that the nature of the product influences export performance. It was therefore essential to become acquainted with offshore-related equipment in order to understand how its nature might influence fieldwork findings.
- (4) It was necessary to identify the problems which Scottish manufacturers had experienced in entering the North Sea market in

order to gain an impression of the type of problems they might encounter in export markets.

- (5) It was intended that the identity of the firms constituting the sample population - that is, firms in Scotland manufacturing offshore-related products as a principal activity - would be uncovered. Contact was established with the Department of Energy's Offshore Supplies Office (OSO), the Scottish Economic Planning Department, the Scottish Development Agency and the Manpower Services Commission in the hope that at least one of these organisations might have compiled a comprehensive list of companies located in Scotland which were involved in the offshore market. Unfortunately this did not prove to be the case and information from these sources was supplemented with details of firms drawn from offshore journals (such as Offshore Services, Ocean Industry and Oilman) and offshore registers (such as those provided by the Highlands and Islands Development Board and the North East Scotland Development Authority). These registers offered the additional advantage of providing the name of a contact - often the managing director or marketing manager who was exactly the person the researcher wished to interview.

As the offshore supplies industry is extremely heterogenous, it was decided to limit the study to companies located in Scotland which were involved in the manufacture of offshore-related equipment as a principal activity, this being the sector of the industry for which exporting was likely to appear most essential (and also therefore most likely to be interested in, and cooperate with, the study). However, it should be noted that it was impossible to compile an exhaustive list of companies comprising the sample population and thus some manufacturers heavily involved in the offshore market may have been omitted while other companies may have been incorrectly included.

7.3 SURVEY OF MAJOR FACTORS INFLUENCING THE EXPORT PERFORMANCE OF THE SCOTTISH MANUFACTURING SECTOR OF THE OFFSHORE SUPPLIES INDUSTRY

7.3.1 Survey Aims & Hypotheses

It was explained in Chapter 2 that much of the equipment produced by Scottish offshore-related manufacturers is only demanded in association with the development of new offshore oil fields and that therefore these firms are heavily dependent upon a high level of development activity being maintained. However, it was explained in Chapter 3 that as the North Sea matures as an oil province development activity will fall in real terms. Indeed, it will be argued in Chapter 11 that development expenditure in the U.K. sector of the North Sea will decline in real terms quite sharply over the period 1982-85. Despite this decline in the domestic market, it was stressed in Chapter 5 that offshore-related manufacturing employment might nevertheless be maintained in Scotland if these companies were to vigorously develop the export markets for their products.

However, little is known about the nature and extent of the involvement of Scottish offshore-related manufacturers in export markets¹ and virtually nothing about the factors which influence their export performance. The first (and main) phase of the fieldwork sought to make a contribution to this end by carrying out a thorough investigation of the nature of the exporting activity undertaken by Scottish offshore-related manufacturers. Although interesting new statistical data on the current marketing position (and, in particular, export performance) of these firms was collected, the main objective of this survey was to identify the major factors which influence the aims and attainment of Scottish offshore-related manufacturers with respect to exporting. In effect, the factors influencing export performance were to be investigated.

It was shown in Chapters 5 and 6, which presented a synthesis of previous work in this area, that many factors specific to the individual

1. The limited statistical evidence available concerning exports of offshore-related equipment by manufacturing firms located in Scotland was presented in section 4.2.2 above.

firm - such as managerial attitude to exporting and size of firm - may influence export performance. Moreover, there is considerable heterogeneity between firms in the so-called offshore supplies industry with respect to factors which it appeared might influence export attainment. For these reasons the study was undertaken at the level of the firm.

Figure 6.1 (above)² provided a diagrammatic representation of what would appear - on the basis of the synthesis of the literature on export determination - to be the major factors likely to influence a firm's export performance. Hence this figure outlined the major topics requiring detailed examination in the course of the first phase of interviewing. In particular, among the hypotheses to be considered were the following :

- (1) A firm's export performance will be influenced by the export marketing methods it employs, specifically :
 - a. Those firms which possess up-to-date export marketing intelligence (based ideally on first-hand research) will be more successful in export markets than those firms with inadequate marketing information.
 - b. Export performance will be highest in those firms which undertake a range of promotional activities in export markets, although individually the most important form of export promotion for industrial products will be personal selling (with, if possible, a permanent sales presence being established in export markets).
 - c. Although agents may be employed to provide contacts and languages in negotiations, the most effective method of distributing industrial equipment overseas will be direct to the customer.
 - d. Those firms which adapt their marketing mix in order to satisfy the differing needs of their export customers will be more successful exporters than firms which attempt to utilise a standard marketing mix (developed originally for the domestic market) worldwide.

2. See p.124.

- (2) As those marketing methods associated with a high level of export performance - such as the collection of adequate marketing intelligence, the use of a range of promotional methods and the adaptation of the marketing mix - are also those requiring the greatest commitment of resources to exporting, large firms will, in general, be more successful in export markets than small firms.
- (3) The devotion of adequate resources to exporting will depend not only upon a firm's size (and other characteristics) but also upon how its senior executives regard exporting. Hence, in this way, managerial attitude to exporting will have an important influence on export performance.
- (4) Management's attitude to exporting will itself be influenced by its perception of future trends in both the domestic and export markets; its perception of the benefits of, and problems associated with exporting; the nature of its previous exporting experience; firm characteristics and the nature of its product(s). Hence these factors will all exert an indirect influence on export performance.
- (5) Those firms which do not possess the resources and capabilities necessary for large-scale exporting may nevertheless achieve some success in export markets by :
 - a. concentrating their limited resources on the effective development of a smaller number of export markets than large firms.
 - b. utilising the export services provided by several organisations such as the BOTB and trade associations - hence small firms will make fuller use of these export services than larger firms.

7.3.2 Why Qualitative Research?

The major reason for selecting a qualitative approach was recognition that quantitative techniques involving the use of a structured questionnaire represent a very rigid approach. The respondent's

attitudes and motivations are categorised into predetermined 'slots' which have been designed by the researcher based on his own experience and thus these 'slots' may or may not reflect the real range of categorisations held in the market place. For example, when structured questionnaires are used at interviews³ or in postal questionnaire surveys⁴ typically 6 - 8 alternative responses will be provided, with space being left for 'others' to be suggested by respondents. However, simply leaving space does not solve the problem entirely, the result being that the findings emphasise the criteria provided by the questionnaire and underestimate or even fail to recognise the importance of other factors not provided as possible answers. Moreover, respondents in industrial marketing research often do not like to be constrained by the 'straightjacket' imposed by structured interviewing.

In contrast, the qualitative method is relatively free and unstructured, and is loose enough in approach to avoid the danger of predetermining or categorising responses prior to the interview situation. Both the interviewer and the respondent are free of the constraints imposed by a structured questionnaire, and while the respondent is allowed to develop lines of thought and associations which he believes are relevant, the interviewer is also free to follow up on responses by asking supplementary questions to clarify or amplify the original response, resulting in greater depth of information being obtained. When a structured questionnaire is used the interview follows rigid, predetermined lines rather than natural thought channels and deviations of this nature are impossible (Adler, 1966; Goodyear, 1971; Stacey & Wilson, 1963; Moser & Kalton, 1971).

The researcher intended to examine managerial attitudes to exporting. However, the factors which senior executives think influence their own decisions and hence their firm's export performance may not necessarily be those that are actually relevant, that is, the interview method is always dependent upon the accuracy of the respondent.

3. As appears to have been the case in the studies undertaken by Tookey (1964) and MacKay (1964).

4. Of the type carried out by P.E.P. (1964), Hirsch (1971), IMR (1978) and ITI Research (1979).

Furthermore, a manager may not wish to reveal his own real attitudes towards exporting. For example, profitable opportunities in overseas markets may be ignored because domestic marketing is easier or because of a 'fear of the unknown'. While these may be the true motives behind a firm's export policy the respondent may distort his responses in order to place himself in a more favourable light with respect to the interviewer or because a truthful description of his attitudes would be damaging to his ego. Hence, while the respondent may reveal accurately what he did, his explanation of why he did it may reflect what he wants the interviewer to believe (and also perhaps what he himself would like to believe). Thus, using direct questions may result in respondents giving rationalisations of their true motives (Elliott & Christopher, 1973; Oppenheim, 1966; Goldman, 1970). Qualitative research offers the opportunity to approach the subject indirectly and to probe responses in the course of the discussion in order to get below the respondent's surface reactions and discover the more fundamental motives underlying his attitudes and behaviour (Elliott & Christopher, 1973; Kinnear & Taylor, 1979; MacFarlane Smith, 1978).

Thus, qualitative research was selected because the nature of the research problem - involving, as it did, the study of managerial attitudes to exporting - required a more flexible approach than could be provided by the standardised interviewing techniques offered by a structured questionnaire. It was clear that categorisation of responses into predetermined 'slots' should be avoided and that in order to get below the surface rationalisations of behaviour it would be necessary to be free to probe responses to achieve greater depth (and, hopefully, greater accuracy) of information.

7.3.3 Sampling Procedure

The list of offshore-related manufacturers provided in Appendix 4.1 represented the sampling frame, that is, the list from which the sample was selected. As mentioned above, this list may be incomplete or inaccurate, although all reasonable steps to ensure accuracy were taken. Had the intention been to select a random sample, the sampling frame would have represented an important

source of bias in that not all firms would have had an equal chance of selection. However, qualitative research involves small numbers of respondents drawn from the sample population and although the sample selected may be roughly representative of different categories of respondents within the sample frame, they will not usually be selected on any probabilistic basis (Sampson, 1972).

The sampling procedure utilised involved two major departures from random sampling. Yeomans (1968b) states that possibly the most important reason for a modification to straightforward random sampling is lack of homogeneity in the sample population. If each possible sample has the same chance of occurring then there is always the possibility of a very unrepresentative sample being drawn. When there are well-defined categories within the population the possibility of an unrepresentative sample can be avoided by taking a predetermined number of units randomly from each category. This procedure, known as stratified sampling, thus ensures that the different strata of the population are represented in the sample in the correct proportions (Yeomans, 1968b; Elliott & Christopher, 1973; Moser & Kalton, 1971). It was apparent from the results of previous research studies that the nature of the product exerted considerable influence on export performance. It was therefore decided to subdivide the population into different product categories - as shown in Appendix 4.1 - and sample from each subsection rather than from the total population.

However, there was still the chance that the selection of firms from each strata on a random basis would produce a very unrepresentative sample - indeed, given the limited involvement of Scottish manufacturers in offshore markets overseas it would have been possible for random sampling to produce a sample of non-exporters, resulting in the survey being of limited value. It is for this reason that many industrial surveys do not use a formalised sampling technique, but rather the '80-20' rule, which is a generalisation that in most markets 20% of the firms produce or consume 80% of the product. Thus by selecting and surveying the vital 20%, 80% of the market can be covered thoroughly. It was therefore decided to maximise coverage of offshore-related manufactured exports by initially selecting those companies which, on the basis of the desk research,

appeared to be the major Scottish exporters of offshore-related manufactured goods. As these exporters tended to be large companies, smaller companies were then selected in such a way as to make the sample more representative of the various product categories.⁵ In all 45 firms were contacted, but 5 of these were unwilling to cooperate with the study. When interviews had been carried out in 40 firms reasonable coverage of the Scottish manufacturing sector of the offshore supplies industry was judged to have been achieved.⁶ However, this method of selection, together with the fact that a few of the firms selected had been wrongly classified on the basis of the information provided in the offshore registers etc, resulted in the sample drawn being only roughly representative of the various categories of respondent firm in the sample frame, although the only category totally unrepresented is 'other manufacturing industries', which comprises smaller firms with widely varying capabilities. Thus, a qualitative sample of Scottish offshore-related manufacturers was selected in such a way as to include both large and small firms with varying manufacturing capabilities and exporting different proportions of turnover. In addition, an effort was made to include both new and established firms, as well as both U.K. and foreign firms.

A profile of the 40 firms surveyed is presented in section 7.3.4 below. The information concerning the size, nationality, offshore-related involvement and other relevant characteristics of these firms results from a statistical questionnaire completed during the course of the first phase of the fieldwork.

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5. The suppliers of the major items of offshore equipment - namely the shipbuilders and platform fabricators - were, however, identified and treated separately from the rest, as, given their importance, the intention was to undertake interviews in each of these firms. Unfortunately the management team of Ayrshire Marine Constructors had not been finalised at the time at which the fieldwork was undertaken, while two other platform constructors refused to cooperate, with the result that only three out of six platform constructors were included in the study.
 6. The researcher took into account the trade-off between improved coverage and increased resource cost. Although only 40 manufacturers were included in the survey, it is estimated below that these firms accounted for approximately 70-80% of total offshore-related manufacturing in Scotland (see footnote 12 on p.137).

7.3.4 Sample Profile : Characteristics of Respondent Companies

The survey covered 40 units manufacturing offshore oil and gas related equipment for use in the U.K. sector of the North Sea and other areas of offshore activity. Relevant characteristics of these units are provided in Appendix 7.1,⁷ while Appendix 7.2 provides aggregate employment, turnover and exporting data for the 40 firms surveyed.⁸

The 40 units consisted of 16 local Scottish companies; 10 subsidiaries controlled by headquarters in England & Wales; 4 joint-ventures between at least one British company and at least one foreign company; and 10 subsidiaries of foreign companies (9 with headquarters in the U.S.A. and the other Europe).⁹

Of the units which had been established in Scotland prior to the development of the central and northern North Sea from 1970 onwards, only six had supplied equipment - namely casing, wellhead equipment, ball valves, power plant and telemetry and communications equipment - to offshore markets elsewhere in the world prior to that date.¹⁰

The remaining ten established units were firms only attracted into the offshore business by the proximity of the North Sea (although some of these had previously supplied onshore petrochemical plant which was in some cases similar to its offshore equivalent). The units described in Table 7.1 (below) as 'new units' were all only established in Scotland following the discovery of North Sea oil in the early 1970s and therefore had no experience themselves of supplying other offshore markets. In addition to completely new, independent companies, this group of units included new subsidiaries of both traditional British engineering companies and U.S. oil-related manufacturers. Indeed, the new units surveyed included seven subsidiaries of U.S. companies with plants manufacturing oil-related equipment in the U.S.A.

7. Where the terms - such as nationality, unit and offshore-related involvement - used in this section are also defined.

8. Aggregate data only is provided in order to maintain anonymity.

9. See Table 7.1 (below)

10. See Table 7.1 (below)

and elsewhere, three joint-ventures involving partners with construction yards overseas and two subsidiaries of U.K. companies which had supplied the southern North Sea gas fields during the 1960s from bases established in eastern England. Hence, in addition to the six units with prior offshore-related experience, twelve of the new units were part of larger organisations with previous experience in other offshore markets.

TABLE 7.1

Nationality and Offshore Experience of Respondent Units

Nationality	Offshore Experience			All Companies
	New Units	Established Units: no Previous Experience	Established Units: with Previous Experience	
Scottish	9	6	1	16
U.K.	3	4	3	10
Joint-venture	4	0	0	4
Foreign	8	0	2	10
All Companies	24	10	6	40

SOURCE : Interview data

It can be seen from Table 7.2(B) that established firms were, in general, larger than new units (with the exception of the platform fabricators which are large-scale operations). However, it should be noted that only two of the eight newly-established foreign units employed 150 employees or less, compared with seven out of nine new Scottish firms. Moreover, Table 7.2(A) indicates that the majority of the Scottish firms were small while the U.K. units included in the sample were, generally speaking, large. Indeed, Appendix 7.2 shows that the 16 Scottish firms provided only about 25% of the

TABLE 7.2

Nationality and Offshore Experience of Unit by Size

	Number of Employees			All Companies
	Up to 150	151-1000	over 1000	
(A) <u>Nationality:</u>				
Scottish	10	4	2	16
U.K.	2	3	5	10
Joint-venture	0	2	2	4
Foreign	2	6	2	10
(B) <u>Offshore Experience:</u>				
New unit	11	9	4	24
Established unit with no experience	3	3	4	10
Established unit with experience	0	3	3	6
All Companies	14	15	11	40

SOURCE : Interview data

sample's total employment and sales, while the 10 U.K. units were responsible for over 40% of total turnover and over half the sample's total employment.

Total turnover of the units surveyed was an estimated £615.5 million, of which £273.1 million (44.4%) was offshore-related. Sales of offshore-related equipment accounted for £247 million (40.1%).¹¹ Together these 40 units employed 39,937 people.¹²

11. See Appendix 7.2. These are gross output figures and therefore not comparable with the data provided in Chapter 4 which related to net output.

12. It proved impossible to gauge accurately the level of offshore-related employment in units only partly involved in offshore-related activities. If it is assumed that around 40% of employees were involved in offshore-related manufacturing, this would suggest that oil-related

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Although the units surveyed all regarded themselves as being involved in the offshore oil business as a principal activity, the extent to which they were involved in offshore-related manufacturing activity varied considerably, as shown in Table 7.3 (below).

TABLE 7.3

Nationality and Offshore Experience of Unit by Involvement
in Offshore-related Manufacturing Activity

	Sales of Offshore-related Manufactured Goods as a Percentage of Total Sales			All Companies
	0 - 33	34 - 66	67 - 100	
(A) <u>Nationality:</u>				
Scottish	7	4	5	16
U.K.	6	1	3	10
Joint-venture	0	1	3	4
Foreign	3	3	4	10
(B) <u>Offshore Experience:</u>				
New unit	5	6	13	24
Established unit with no experience	8	2	0	10
Established unit with experience	3	1	2	6
All Companies	16	9	15	40

SOURCE : Interview data

This table also illustrates that the new units which had been established in Scotland since the discovery of North Sea oil were generally more heavily involved in offshore-related manufacturing activity than the other

/cont'd

manufacturing employment in these units was in the region of 16,000 people (approximately 80% of total offshore-related manufacturing employment in Scotland). However, given that the Scottish Office (1979c) found output per employee to be considerably higher in oil-related industry than in Scotland as a whole, this assumption is liable to overestimate oil-related employment in these units.

units, particularly the established firms which only entered the offshore market in the 1970's. In particular, 13 out of the 24 new units derived more than two-thirds of their turnover from offshore-related manufacturing (and, with the inclusion of offshore-related service activity, this rises to 18 out of 24 units). Table 7.3 (A) also shows that the joint-ventures and subsidiaries of foreign companies included in the sample tended to be more heavily involved in offshore-related manufacturing than the units falling into the other two categories.¹³ This can also be seen from the fact that the units with foreign participation accounted for only 31% of the sample's total sales but almost 55% of its offshore-related manufactured turnover.¹⁴ In contrast, the Scottish firms - which were in general smaller (see Table 7.2(A)) and less reliant on offshore-related manufacturing (see Table 7.3(A)) than the other units - were responsible for only 11% of the sample's total sales of offshore-related equipment.¹⁵

In fact, further analysis revealed that sales of offshore-related equipment were heavily concentrated in a few of the units surveyed. Indeed, 4 units accounted for over half and 8 units for three-quarters of the sample's offshore-related manufactured turnover, while, at the other extreme, 20 units together were responsible for just under 6% of the sample's total sales of offshore-related equipment.

Although 27 of the 40 units surveyed undertook some form of exporting, Table 7.4(A) reveals that the foreign units were generally more heavily involved in exporting than the other units, particularly the Scottish firms (and the joint-ventures, three of which were platform yards). Indeed, the 5 new units identified in Table 7.4(B) as exporters of over two-thirds of their turnover were all subsidiaries of U.S. companies. Apart from these exceptions, the established units tended to export a higher proportion of their turnover than the newly-established units. Table 7.4(C) shows that for the sample as a whole there was a clear association between size of unit and proportion of total turnover exported, with only 1 of the 14 small units (150 employees or less) exporting more

13. Moreover, none of the units with foreign participation sold equipment outside the oil, gas and petrochemical sector, compared with over half the Scottish firms and all but one of the U.K. units.

14. See Appendix 7.2.

15. See Appendix 7.2.

than one-third of their output, compared to 13 of the 26 larger units. Once again, this result ties in with the previous findings on the association between export performance and experience/nationality in that the established firms and the new subsidiaries of U.S. companies were larger than the new units established by Scottish and U.K. firms.¹⁶ Thus, to summarise, small, newly-established, Scottish and U.K. units were found, in general, to be less involved in export markets than the larger, more experienced U.S. subsidiaries and those firms which had been established for some time.

TABLE 7.4
Nationality, Offshore Experience and Size of Unit by Total
Involvement in Exporting

	Exports as a Percentage of Total Sales				All Companies
	NIL	1-33	34-66	67-100	
(A) <u>Nationality:</u>					
Scottish	7	7	2	0	16
U.K.	1	4	3	2	10
Joint-venture	4	0	0	0	4
Foreign	1	2	2	5	10
(B) <u>Offshore Experience:</u>					
New unit	10	9	0	5	24
Established unit with no experience	3	4	2	1	10
Established unit with experience	0	0	5	1	6
(C) <u>No. of Employees:</u>					
Up to 150	6	7	0	1	14
151 - 1000	4	4	3	4	15
over 1000	3	2	4	2	11
All Companies	13	13	7	7	40

SOURCE : Interview data

16. See Table 7.2.

Data relating to exports of offshore-related equipment by the sample will be analysed in the following chapter.

7.3.5 Interview Method

The first approach made to a selected firm was in the form of a typed letter.¹⁷ This letter was followed, approximately three to four days later, by a telephone call to arrange a specific time for the interview.

Only five firms refused to cooperate with the study. Response was thus excellent - almost 90% - and in most cases information was freely given. Interviews were undertaken in 40 firms during the period June to September 1979.

The face-to-face, in-depth interview is less structured and more intensive than a standardised questionnaire-administered interview, with extensive probing being used to encourage a single respondent to talk freely and express detailed beliefs and feelings on a topic (Sampson, 1972; Kinnear & Taylor, 1979). Although in-depth interviews are sometimes called unstructured or non-directive interviews, the interviewer must have clear objectives and will normally have at least an outline plan of the broad areas which are to be discussed or perhaps a list of prepared questions which will form the framework within which the interview will be undertaken.

The topics list - of the areas to be covered in the course of the interview - used during the fieldwork is reproduced as Appendix 7.5. As the commitment which respondents were willing to make was assumed to be limited, the number of the topic areas was restricted to twelve - this being the number which it was expected could be covered adequately in 1-1½ hours - although within each area there are two or three general questions listed. These questions were either very important and therefore not to be forgotten on any account, or important and not obvious from the topic headings on the topics list. The intention was, however, that these questions would arise naturally in the course of the discussion with the

17. See Appendix 7.3. This contact letter was accompanied by a covering letter from Professor Norman Hunt, Head of Department, vouchsafing the integrity of the study - see Appendix 7.4.

respondent.

The specified topics represent the main area of discussion covered in each interview, around which flexibility was allowed when it was advantageous. The rationale for this method of interviewing was to remain flexible but to stay in control in order to maximise the collection of relevant data. Thus, for example, although a specific list of points had to be covered, no formal questions to be asked in a particular manner at a particular point in time were devised and there was freedom to move the discussion from one subject to another, according to the situations which arose during the interview.

7.3.6 Analysis

The qualitative research data on each of the 40 firms consisted of the transcription - running, on average, to around ten pages of 4,000 words - of the respondent's replies to the questions asked during the course of the interview, which typically lasted 1 - 1½ hours. As pointed out by Cooper et al (1970), there is a danger when carrying out an investigation at the level of the individual firm that so much detail peculiar to individual firms may be uncovered that it is difficult to identify common trends. It was therefore necessary to condense this quantity of material in some way so as to discern important common factors from the mass of detail. The methods of analysis of qualitative or unstructured data vary according to the purpose for which the results are to be used, but generally these methods are referred to as 'content analysis', although Elliott & Christopher (1973) and Moser & Kalton (1971) distinguish between 'content analysis', where the data is pre-existing, and 'coding' where the data has been specially produced.

Content analysis may be undertaken by computer. This involves transcribing the qualitative data onto punch cards and assigning 'tags' to various messages or characteristics contained therein. The computer then scans the punch cards and plots the number of cases in which the tags are used, in this way providing some measure of the intensity of feeling placed upon the tags. However, computer analysis is most appropriate when a large sample is selected, as only then will

the time spent creating the common vocabulary be cost-effective. In the case of the present study it was more economical to undertake the analysis by hand.

The coding process used consisted of the researcher reading each respondent's answer to a particular question and 'coding' it by deciding that it should go into a certain category. For example, when asked about the problems associated with exporting, one respondent replied :

"Because of the Irani boycott as a wholly-owned U.S. subsidiary we can't get business in Iran ... and the same thing could happen elsewhere, in Libya, for example, which is politically volatile."

This response was coded into the category of exporting problem entitled 'political factors'. Two points are worth noting with respect to the coding process. Firstly, when a number of respondents are placed into the same category the implication is that they will all be treated as equal for the purpose of analysis and hence coding different respondents into the same category necessarily involves losing some of the information held about them (Elliott & Christopher, 1973; Simon, 1969).¹⁹ Secondly, the researcher designed and employed his own categorisation relevant for his purposes. However, the net effect was not the same as would have resulted from redesigning the questionnaire in the form of multiple-choice questions offering these categories, as there were good reasons for allowing the respondent freedom to express himself,²⁰ while the imposition of the researcher's categorisation was also delayed until he had gained experience of the true motivations held by respondents.

19. Moser & Kalton (1971) argue, however, that as one of the points of a less formal approach is to obtain a more complete picture of the topic area than a formal interview would allow, if this gain is not to be sacrificed the analysis must contain a fair amount of the detail rather than simply compressing it into statistical tables. As one of the principal reasons for the adoption of a qualitative approach was the acquisition of a more detailed representation of the factors influencing a management's attitude to exporting (and hence its aims and attainment with respect to exporting), in the analysis of the results which follows - in Chapters 8 to 12 - individual responses will be quoted where doing so is useful in explaining or illustrating a point made in the main body of the text.

20. As has already been explained in Section 7.3.2 above.

The units of analysis in the case of qualitative data may be the total response of one respondent to one question, a theme (of which there may be several in a response), or simply a word or phrase. Analysis by hand allows not only the computation of the frequency of occurrence of units of analysis, but also permits insights into motivation to be provided (by a perceptive researcher reading between the lines) which would otherwise be overlooked by a computer analysis which tends to rely upon weight of evidence. (Elliott & Christopher, 1973).

The variables of analysis selected were those considered to be of importance (in terms of their influence on exporting success) in their own right (such as size of firm) or those thought likely to be helpful in understanding another variable - for example, management's perception of the problems associated with exporting was investigated in order to analyse this factor's influence on management's attitude to exporting and hence exporting success.

Having selected the variables of analysis, it was necessary to choose and define the categories for each variable. Some classification decisions were taken at the research design stage, prior to undertaking the fieldwork. For example, at this stage it was decided to include offshore-related manufacturers which had not, up to that point, become involved in export markets. However, much of the category selection work - such as the categories of exporting problems - was undertaken after the data had been collected, with an effort being made to ensure that the categories were defined so as to make certain that observations would fit clearly into one category or another.²¹

7.4. SURVEY OF EXPERT OPINION ON THE GLOBAL OFFSHORE MARKET 1980-85

Desk research on world markets for offshore-related equipment had been undertaken at an early stage. However, it was necessary for the

21. In addition to the qualitative data, a certain amount of statistical data resulted from a short structured questionnaire (see Appendix 7.6). Apart from providing interesting new data on the level of exporting being undertaken by Scottish offshore-related equipment manufacturers, this statistical information also provides a check on answers given during the in-depth study of the factors influencing export performance.

researcher to gain sufficient expertise to enable the development of a scenario of the global offshore market situation (in the period 1980-85) to which respondents could react, and the information uncovered during the desk research phase was considered to be insufficiently detailed for this purpose. For this reason a small-scale survey of expert opinion was undertaken.

A qualitative forecasting method was utilised because it was recognised that quantitative forecasting techniques - which depend heavily upon the availability, reliability and utilisation of historical data - often fail to take into account the wide range of factors which influence the variables forecasted. Indeed, reliance upon historical data and statistical relationships frequently produces inaccurate forecasts because the limited number of quantified relationships that can be formed are often inexact explanations of the subject-matter of business forecasts (Campbell, 1966). It is for this reason that many business organisations adopt a multi-system approach, combining forecasts from statistical measurements, opinions of company employees etc, with the final forecast being determined subjectively by the individual(s) responsible for forecasting and/or planning. However, Helmer & Rescher (1959) point out that utilisation of non-quantifiable background opinion involves the problem of weighting *prima facie* evidence in relation to this background information, which frequently may be intuitive in character. Given this problem Helmer & Rescher suggest that considerable importance should be attached to experts in the field :

"for the expert has at his ready disposal a large store of (mostly inarticulated) background knowledge and a refined sensitivity to its relevance ..." (Helmer & Rescher, 1959, p.38).

In fact, the employment of experts forms the basis of all qualitative forecasting and various techniques representing alternative procedures for helping experts to express their subjective judgement of future trends have been developed.²² In selecting a qualitative forecasting technique a choice had to be made between a group and an individual approach. Evidence of the relative efficiency of the group vis-a-vis the individual in problem-solving activities was reviewed²³ and the

22. See Wheelwright & Makridakis (1973)

23. For more detail see, for example, Campbell (1966); Argyll (1972); Schein, (1970).

Delphi Technique²⁴ in particular, was considered in some detail. However, group solutions were found to be time-consuming and costly to administer. Hence the more straightforward approach of combining various expert judgements into a subjective 'average' was selected.

As far as the global market²⁵ for offshore-related equipment was concerned, the objective of the survey was the identification of the major areas of offshore development activity during the period 1980-85 and the main factors likely to influence export potential (such as indigenous engineering capability, government policy with respect to imports and environmental conditions) in these areas. Detailed studies of individual geographical and product markets were considered both unnecessary (given the objectives of the research) and impossible, in terms of the time and effort such a task would require. Moreover, attention was concentrated on the development stage as most equipment purchases are associated with this phase of activity. It was necessary that the time period chosen for discussion be sufficient to allow the formulation and implementation of the corporate strategy considered most appropriate given the hypothetical market situation. Evidence suggests that in the case of market diversification, which might involve the establishment of facilities overseas or the recruitment, training and support of an efficient sales force, a time period of five years was probably the minimum required. On the other hand, it was considered dangerous to present the respondents with a projected market situation beyond 1985 as, given the tremendous pace of change in the industry, the operation might be regarded as inappropriate or even worthless by the respondents, resulting in half-hearted or even non-cooperation. Moreover, five years is a common planning horizon for companies supplying industrial markets (Barnsley, 1978).

With respect to the U.K. market there were two main objectives. Firstly it was necessary to provide some indication of the anticipated level of

24. This is a method of systematically soliciting and collating expert opinion with the objective of obtaining the most reliable consensus. This technique replaces direct debate with a carefully designed programme of sequential individual interrogations, usually by postal questionnaire. For further details see, for example, Helmer (1966); Dalkey & Helmer (1963); Gordon (1968); Gordon & Helmer (1964); Helmer (1968); Campbell (1966); Lloyd & Rawnsley (1978); Dale (1973).

25. Excluding the U.K. sector of the North Sea.

equipment ordering in the period 1980-85. It was decided to project the pattern of field developments and production platform ordering during this period since with the present state of technology nearly all field developments require a platform of some form (while the platform is also the single most expensive item of equipment purchased and is therefore very important in its own right). Thus the number, size and timing of field developments and platform orders provide an indicator of the overall level of offshore business. The second objective was to provide some indication of the capacity loading in the industry anticipated in the period 1980-85. It was decided to project development expenditure as this is incurred in either staged payments or a single payment on completion of an order and hence provides some measure of the capacity loading in the industry. The credibility of the projections does, however, decline as the time horizon lengthens.

It was necessary that the discussion of the U.K. market be in greater detail than that of the world market, as previous studies had found that corporate strategy may depend critically upon the domestic market situation and the capacity loading in the industry. However, detailed study of the U.K. market for particular products was considered to be impossible given the time constraint imposed by the nature of doctoral research. In addition, even detailed studies have in the past proved extremely inaccurate. For example, over-optimistic platform forecasts were partly responsible for the excess of U.K. platform sites. Moreover, detailed studies of this kind were unnecessary, particularly as the market for many items of offshore-related equipment varies with the number of field developments going ahead and the number of platforms being ordered. It was therefore sufficient simply to identify general trends. Where appropriate some indication of the size of the market for particular products can be derived by using the aggregate figures projected in association with rough equipment breakdowns (such as those shown in Chapter 2).

The survey of expert opinion consisted of interviews with officials of nine organisations - six banks/investment managers/stockbrokers and three government agencies.²⁶ A larger survey was considered but seemed to add little of value to the thesis while being expensive in terms of both time and money. In particular :-

26. The organisations which constituted the panel of experts are listed as Appendix 7.7.

- i. A consensus on most of the scenario topics had already emerged from the interviews undertaken with the nine panel members.
- ii. As the oil companies themselves are reluctant to disclose up-to-date information while most other organisations - with the exception of certain banks, stockbrokers and government agencies - are dependent upon published information of the kind surveyed by the researcher during the desk research phase, further interviewing was unlikely to improve accuracy to any great extent.
- iii. Many forecasts in the area of oil and gas (and energy in general) - prepared by organisations (including the oil companies) with considerable resources devoted to forecasting the future trends in this sector - already exist.

The data collected during the survey of expert opinion was subsequently analysed and (together with material from the desk research and first fieldwork phases) written up, as presented in Chapter 11 below. The full report was, however, unsuitable for presentation to respondents in the final stage of the fieldwork. In particular, its length was such that interviewees might fail to digest it properly (causing difficulties in the interview) or even refuse to cooperate. For this reason it was decided that the respondents should be supplied with a summary of the most relevant points drawn from the original report.²⁷

7.5 SURVEY OF POSSIBLE FUTURE TRENDS IN THE EXPORT PERFORMANCE OF THE SCOTTISH MANUFACTURING SECTOR OF THE OFFSHORE SUPPLIES INDUSTRY

The objective of the final phase of fieldwork (undertaken in the period February to April 1980) was to ascertain the expected strategic response of the 40 selected manufacturers to a reasonable but hypothetical scenario of the global market for offshore-related equipment in the period 1980-85, with particular attention being paid to the strategic alternative of market diversification.

27. See Appendix 7.8.

The researcher re-established contact with these firms by telephone before sending them a copy of the scenario summary, together with a brief letter of explanation.²⁸ None of the original sample of 40 firms refused to cooperate with the final phase of the fieldwork, although a second interview was not carried out with one organisation which was in the process of being taken over. The remaining 39 interviews were undertaken in a similar fashion to that described above, using the topics list reproduced as Appendix 7.10.

7.6 CONCLUSION

Three phases of fieldwork were undertaken. The first phase of the research was concerned with an appraisal of the factors which influence the export performance of the Scottish manufacturing sector of the offshore supplies industry. However, constraints were imposed on the range of factors which could be discussed by the length and nature of the interviews undertaken, and it is recognised that a number of less tangible factors (such as the quality of advertising, sales personnel etc.) not covered will nevertheless exert considerable influence on exporting success.

The second phase of the fieldwork consisted of a survey of expert opinion which formed part of the basis of a scenario of the global offshore market in the period 1980-85. Finally, a further round of interviewing was undertaken in the original sample of 40 offshore-related manufacturers in order to discover these firms' expected strategic response to the scenario developed by the researcher.

It is important to bear in mind that the sample was selected on a non-random basis and that the firms surveyed are not truly representative of the Scottish manufacturing sector of the offshore supplies industry (much less other groups of firms) and therefore while the analysis reveals certain associations as far as the firms sampled are concerned, it is impossible to generalise from these results. Indeed,

"in qualitative research no attempt is made to draw hard and fast conclusions. It is impressionistic rather than definitive" (Sampson, 1972, p.7)

28. See Appendix 7.9.

That is, whereas quantitative research produces hard information and definite conclusions, qualitative research produces 'soft' information which is tentative or indicative in nature.

CHAPTER EIGHT

OFFSHORE-RELATED EXPORT PERFORMANCE

8.1 INTRODUCTION

The following three chapters present the analysis and discussion of the results concerning the factors influencing the export performance of the Scottish manufacturing sector of the offshore supplies industry. Chapters 9 and 10 are based on the main body of qualitative data resulting from the in-depth interviews undertaken in the surveyed manufacturing firms. While the next chapter concentrates on presenting the analysis of the results concerning the nature of the factors influencing management's attitude towards exporting and their effect on export performance, chapter 10 examines the findings with respect to the relationship between the export marketing methods utilised and export performance. In effect then these two chapters are devoted to the main qualitative findings concerning the major factors influencing export performance, and the reader should bear in mind the diagrammatic representation of these influencing factors presented as Figure 6.1 and the hypotheses outlined in section 7.3.1, against which these results should be viewed and to which reference will periodically be made.

The present chapter is, however, essentially different from the following two chapters in that it provides an analysis of the limited amount of quantitative information which resulted from a short, structured questionnaire, normally completed during the course of the main qualitative study. It should, however, be remembered that although roughly representative of the various categories of respondent firm in the sample frame, the sample was not selected randomly and, in particular, is probably biased in terms of the major exporters of offshore-related equipment.

8.2 THE VOLUME OF EXPORTS OF OFFSHORE-RELATED EQUIPMENT

Of the 40 units surveyed only 22 had exported offshore-related equipment in the year for which data was collected, although a further 3 had exported offshore-related equipment in previous years. It should be noted that the exporters included all 9 of the Scottish

subsidiaries of the U.S. multinationals (the tenth foreign unit being a non-exporting subsidiary of a European company). Together these U.S. subsidiaries accounted for 70% of the total volume of offshore-related equipment exported by the sample, as is shown in Table 8.1 (below).

TABLE 8.1
Exports of Offshore-related Equipment by Nationality of Unit

Nationality	Number of Units		Volume of Offshore-related Equipment Exports	
	Total	Offshore-related Equipment Exporters	£m	%
Scottish	16	9	2.9	5.1
U.K.	10	4	14.7	25.7
Joint-venture	4	0	-	-
Foreign	10	9	39.6	69.2
TOTAL	40	22	57.2	100.0

SOURCE : Interview data

Further evidence of the dominance of offshore-related equipment exporting by the U.S. subsidiaries is provided by the fact that this group of firms provided most of the major exporters of offshore-related equipment (with exports worth £1 million or more per annum) surveyed, as can be seen from Table 8.2 (A).

As explained in Chapter 7, in addition to the 6 established firms which had sold equipment to offshore oil markets prior to the development of North Sea oilfields, the sample also contained 12 newly-established units which were part of larger organisations which themselves did have previous experience in other offshore markets, either in the southern North Sea gas fields or overseas. When both forms of offshore-related experience were taken into consideration, a strong association emerged between prior offshore-related experience and the volume of offshore-

TABLE 8.2
Volume of Exports of Offshore-related Equipment by
Nationality, Offshore-related Experience and Size of Unit

	Exports of Offshore-related Equipment			All Companies
	Nil	Less than £1 million	£1 million and over	
<u>(A): Nationality</u>				
Scottish	7	9	0	16
U.K.	6	2	2	10
Joint-Venture	4	0	0	4
Foreign	1	3	6	10
<u>(B): Offshore Experience</u>				
No experience	14	8	0	22
Prior experience	4	6	8	18
<u>(C): Number of Employees</u>				
Up to 150	6	8	0	14
151 - 1000	6	3	6	15
Over 1000	6	3	2	11
All Companies	18	14	8	40

SOURCE : Interview data

-related equipment exported, with none of the 22 firms without any form of prior offshore experience whatsoever being a major exporter of offshore-related equipment, as shown in Table 8.2(B). Hence although it may be an important advantage in export markets for the group to have had previous experience in other offshore markets, it was not necessarily essential that the particular manufacturing plant located in Scotland had previously supplied offshore markets. Thus, the U.S. subsidiaries (whether new or established), all of which were part of organisations with prior offshore experience, held an advantage over

Scottish and U.K. companies newly-established in the offshore supplies business.

Table 8.2(C) highlights the fact that none of the small units exported equipment worth more than £1 million in the year for which data was collected, suggesting that, as would normally be expected, there was an association between size of firm and the volume of offshore-related equipment exported. Once again, it is worth remembering that only two of the U.S. subsidiaries were small units (and these were, of course, part of much larger organisations).

Evidence was also found of a possible relationship between the nature of the product and offshore-related exporting, in that while relatively few fabricators and manufacturers of major items of equipment were involved in offshore-related exporting, most of the manufacturers of process plant and wellhead and oilfield equipment were exporting offshore-related equipment.¹ In terms of products, the majority

TABLE 8.3
Exports of Offshore-related Equipment by Product Sector

Product Sector	Number of Units		Volume of Exports	
	Total	Exporters	£m	%
Shipbuilding & Marine Engineering; Concrete & Steel Platforms; Steel, Pipe & Pipe-coating	8	2	23.1	40.4
Modules; Fabrications; Sub- contracting; Metal Goods; Under- water Engineering	12	5	1.9	3.3
Wellhead & Oilfield Equipment	9	8	35.95	45.3
Process Plant	5	4	5.17	9.0
Power, Electrical & Electronic Equipment	6	3	1.12	2.0
TOTAL	40	22	57.24	100.0

SOURCE : Interview data

-
1. See Table 8.3. Compared with Appendix 7.1, the product sectors in Table 8.3 have been widened and the corresponding export data aggregated in order to preserve confidentiality.

of offshore-related manufactured exports consisted of casing, wellhead and oilfield equipment and a drilling rig. Significantly, the manufacture of specialised oilfield equipment was dominated by U.S. subsidiaries.

Detailed statistics concerning the volume of exports of offshore-related equipment by country of destination were not collected. However, some indication of the relative importance of various offshore markets is provided by Table 8.4 below. Firstly, of the 22 units which did export offshore-related equipment, 16 exported to at least one European market. Indeed, it is interesting to note that despite the Norwegian Government's well-documented policy of supporting indigenous industry and the fact that the level of demand in Norway was not as high as it was in, for example, Mexico, more units (15) had exported equipment to Norway than to any other single offshore market anywhere in the world. Other important European markets were Holland, Spain, France and West Germany, although several others were also mentioned. The offshore-related equipment exported to France and West Germany was sold to large engineering contractors for offshore projects in other areas of the world, rather than for offshore activities on the continental shelves of these two countries.

TABLE 8.4
Major Export Markets for Offshore-related Equipment
Manufactured in Scotland

Area	Number of Units Exporting Offshore-related Equipment			
	Scottish (9)	U.K. (4)	U.S. (9)	Total (22)
Middle East	6	4	6	16
Europe	5	4	7	16
North America	1	3	4	8
South America	1	3	3	7
Central America	3	0	3	6
Africa	0	1	5	6
Far East	2	2	1	5
U.S.S.R.	0	2	3	5
China	0	3	0	3
Eastern Europe	1	0	0	1

SOURCE : Interview data

Involvement in the Middle East matched that in Europe, with Saudi Arabia, the United Arab Emirates and Iran being the major export markets. It should be noted that more U.S. subsidiaries exported to Africa than to North, South or Central America.² This in part reflects the way in which the multinationals allocate global markets to their various manufacturing plants, with the Eastern Hemisphere (particularly Europe, the Middle East and Africa) usually being regarded as the U.K. plant's sphere of operations, while the Western Hemisphere is normally reserved for the U.S. plant(s).³ While North America might be expected to be a difficult market for U.K. and Scottish firms, the performance of these units in Africa, South and Central America was disappointing. This was especially true of Mexico and Brazil (to each of which only one U.S. and two non-U.S. units had exported) which have in the past been highlighted by the OSO as markets offering excellent prospects to U.K. offshore suppliers.⁴

Further analysis revealed that 3 units together accounted for 67% and 7 units for 90% of the entire sample's exports of offshore-related equipment. The data contained in Tables 8.1 - 8.4 indicate that this small group of major exporters consisted of experienced, large or medium-sized units (most of which were U.S. subsidiaries) exporting casing, wellhead and oilfield equipment and drilling rigs mainly to other European markets and the Middle East.

However, it must be expected that large firms will export a greater volume of offshore-related equipment than smaller firms, *ceteris paribus*. For this reason, the following section will present an analysis of offshore-related export performance in terms of the proportion of total offshore-related sales exported.

-
2. Moreover, the U.S. subsidiaries which were exporting to North America were doing so only on a very limited scale.
 3. The market allocation policies utilised by the U.S. multinationals are discussed in greater detail below, pp. 209-216.
 4. It will be shown below that U.S. companies have established a very strong position in Canada, Mexico and South America - see p.193.

8.3 OFFSHORE-RELATED EXPORT PERFORMANCE

It is evident from Table 8.5(A) below that there was an apparent association between nationality of firm and export performance, in that the subsidiaries of the foreign companies tended to export a greater proportion of their total offshore-related turnover than did other firms. In particular, 6 of the 7 units most heavily involved in offshore-related exporting activity were U.S. subsidiaries.

TABLE 8.5
Offshore-related Export Performance by Nationality,
Experience and Size of Unit

	Proportion of Total Offshore-related Turnover Exported (%)			All Companies
	NIL	1-33	34-100	
<u>(A): Nationality</u>				
Scottish	7	9	0	16
U.K.	6	3	1	10
Joint-Venture	4	0	0	4
Foreign	1	3	6	10
<u>(B): Number of Employees</u>				
Up to 150	6	7	1	14
151 - 1000	6	5	4	15
Over 1000	6	3	2	11
<u>(C): Offshore Experience</u>				
No Experience	14	8	0	22
Prior Experience	4	7	7	18
All Companies	18	15	7	40

SOURCE : Interview data

Section 7.3.4, which presented a profile of the sample, provided evidence suggesting the existence of an association between size of unit and total export performance, that is, the proportion of total turnover exported. However, Table 8.5(B) indicates that although

smaller units tended to export a smaller proportion of their offshore-related turnover than did larger units, there was not a close association between size and offshore-related export performance. (The association may have proved stronger had the employment statistic used as an indicator of size been offshore-related employment rather than total employment, but unfortunately the former proved impossible to assess).

In contrast, when offshore-related experience at both unit and group level was taken into consideration a clear association between offshore-related experience and export performance did emerge, as can be seen from Table 8.5(C). For example, all the firms exporting more than one-third of their offshore-related turnover had some offshore-related experience prior to the development of the oilfields in the U.K. sector of the North Sea.

The researcher had considered it possible that wholly-involved manufacturers might behave differently from those only partly-involved in offshore markets. In particular, it was reasoned that those manufacturers totally reliant on offshore markets might consider the development of offshore-related exports more essential than those firms also selling to onshore customers in the U.K. However, analysis of the quantitative data revealed that for the sample as a whole there was not a significant association between the degree of involvement in offshore-related manufacturing and either the volume of offshore-related equipment exports or the proportion of total offshore-related turnover exported.

Finally, there was evidence to suggest that offshore-related export performance might be influenced by the nature of the product. For example, it can be seen from Table 8.6 that while exports accounted for 23% of the offshore-related manufactured turnover of the sample as a whole, the firms in the wellhead and oilfield equipment sector exported nearly 55% and the fabricators under 5% of their offshore-related manufactured sales.

TABLE 8.6
Proportion of Total Sales of Offshore-related Equipment
Exported by Product Sector

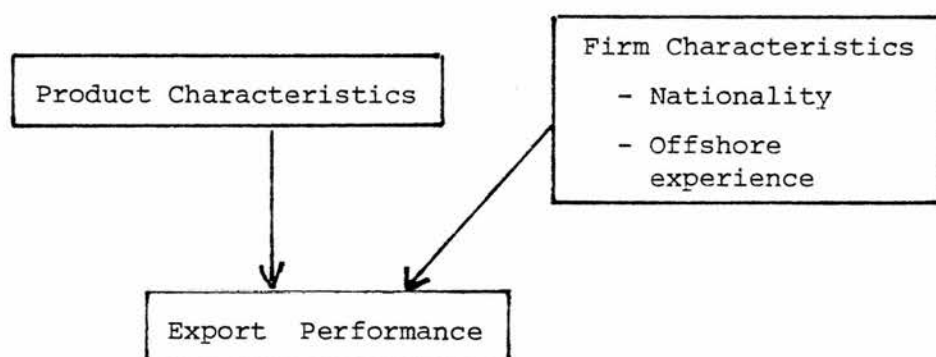
Product Sector	Offshore-related Equipment Sales				Total
	Domestic		Export		
	£m	%	£m	%	£m
Shipbuilding & Marine Engineering; Concrete & Steel Platforms; Steel, Pipe & Pipe-coating	113.3	83.1	23.1	16.9	136.4
Modules; Fabrications; Sub-contracting; Metal Goods; Under-water Engineering	40.7	95.5	1.9	4.5	42.6
Wellhead & Oilfield Equipment	21.6	45.5	25.9	54.5	47.5
Process Plant	10.4	66.7	5.2	33.3	15.6
Power, Electrical & Electronic Equipment	3.8	77.6	1.1	22.4	4.9
TOTAL	189.8	76.8	57.2	23.2	247.0

SOURCE : Interview data

8.4 CONCLUSION

The discussion of the quantitative data presented in this chapter indicates that as far as the sample was concerned there was an association between export performance (measured in terms of the proportion of total offshore-related turnover exported) and certain characteristics of the firm and its products, as shown in Figure 8.1.

FIGURE 8.1
Factors Influencing Offshore-related Export Performance



Although there was some evidence of a relationship between size of firm and export performance, the characteristics of the firm which appeared to exert the strongest influence on export performance were offshore-related experience and nationality. However, it should be remembered that the U.S. subsidiaries were themselves part of large organisations with considerable offshore-related experience manufacturing specialised oilfield equipment. Thus much of the observed variation in export performance apparently associated with nationality of firm might in fact be more correctly attributed to the influence of these other factors rather than to differences in nationality per se.

CHAPTER NINE

FACTORS INFLUENCING MANAGERIAL ATTITUDE TO EXPORTING

9.1 INTRODUCTION

It was argued in Chapter 5 that it was only in those companies in which senior executives adopted a positive attitude to exporting that the resources necessary for successful exporting would be committed. It was further hypothesised in Chapter 7 that there were 6 main groups of factors which might influence managerial attitude to exporting :

- (1) management's perception of future market trends
- (2) management's perception of the benefits of exporting
- (3) management's perception of the problems associated with exporting
- (4) product characteristics
- (5) firm characteristics
- (6) previous export performance.

This chapter presents a discussion of the qualitative findings concerning the relationship between managerial attitude to exporting (and the factors by which it is influenced) and export performance.

It was pointed out in the previous chapter that altogether 25 of the 40 firms surveyed had exported offshore-related equipment.¹ In section 9.2 the nature of the offshore-related exporting activity undertaken by the sample will be discussed in greater detail. This section also contains an examination and analysis of the attitude towards exporting adopted by the managements of the firms constituting the sample (as evidenced by their stated export aims and the export policies they have implemented) and the relationship between this attitude and exporting success. In the course of the exposition of managerial attitudes to exporting, the influence exerted by firm characteristics and managerial perception of future market trends will begin to become apparent, although it is not until section 9.3 that the association between managerial attitude to exporting and firm characteristics, future market trends and previous exporting experience is analysed in detail. The findings concerning the relationship between management's attitude to exporting and its perception of the benefits and problems associated with exporting will be discussed in sections

1. 22 firms had exported offshore-related equipment in the year for which data was collected while a further 3 had exported offshore-related equipment in previous years.

9.4 and 9.6 respectively, while section 9.5 provides an analysis of the nature of the comparative advantages which the surveyed firms claimed to hold over their international competitors.

9.2 MANAGERIAL ATTITUDE TO EXPORTING AND EXPORT PERFORMANCE

This section provides further details of the nature of the exporting activity undertaken by the sample and identifies the managerial attitude to exporting - as indicated by their own description of their aims and policies with respect to exporting - in each of the surveyed firms. This discussion is carried out by product sector and the nomenclature occasionally used in this section corresponds with that provided in Appendix 7.1. The section concludes with an analysis of the association between managerial attitude to exporting and export performance.

Shipbuilding; Concrete & Steel Platforms; Steel, Pipe & Pipe-coating

Only two of the firms in this sector exported offshore-related equipment in the year for which data was provided, although one of the shipyards had previously exported an offshore-related vessel.

None of the platform fabricators surveyed were involved in export markets. One of these yards was not even trying to export because it considered that platforms were such basic items of equipment that they had no export potential :

"If we could export we would be pleased to do so, but there is no chance of exporting platforms, there's plenty of ability to manufacture these in other countries."

In contrast, the other yards had both tried to win export contracts and had between them tendered unsuccessfully for platform orders for West Africa, Brazil, India and Abu Dhabi. Despite this evidence suggesting that it is extremely difficult to export platforms,² both these yards believed that there was still a chance of exporting platforms and both stated that they would step up their exporting efforts if the domestic market were to decline, as one explained :

"We're happy with our patch, the North Sea. (Nevertheless) the export potential is there and if the market does not pick up we'll set our sights abroad."

The pipecoating yard (R) was also forced to admit that although it hoped to export in the future, with so many yards already in existence

2. One of the large fabricators also remarked that "the chances of an export platform order are virtually nil."

around the world it was unlikely that it would win a lot of export business. On the other hand, the casing manufacturer (S) exports its tubular products to offshore markets throughout the world and treats export and domestic markets equally. A similar attitude was adopted by the firms in the shipbuilding sector, with the following being typical of the explanations provided :

"It's a world market. It doesn't matter where the order comes from, export and domestic markets are looked at equally."

Unfortunately only the rig-builder (C) had been successful in export markets in the year for which data was collected, and one of the other shipyards admitted that there was very little chance of exporting support vessels.

Modules; Fabrications; Sub-contrating; Metal Goods; Under-water Engineering

Of the four module fabricators surveyed, two had exported offshore-related equipment but only on a very minor scale. In fact, one of these had decided to concentrate in the future on developing the domestic market :

"Because we are new we must concentrate initially on our backdoor market (and although) we keep an eye on the international market we don't want the majority to be exports, it's dangerous to rely on export markets in that way."

Moreover, the other exporter had decided to withdraw from exporting altogether :

"We're a small company and we want to grow carefully and sensibly. We've been too busy in the North Sea to follow it up at the moment. We keep it there because things could go quiet in the North Sea."

While one of the other (non-exporting) firms had never really tried to export because it had "always seemed to have had plenty of work from the domestic market", the other had been trying (unsuccessfully) to export, despite the fact that it considered that there was very little chance of it being successful in export markets. Thus, the firm to have launched the most serious attack on export markets was also the least optimistic about the export potential of modular units.

There appeared to be a relationship between the degree of sophistication of a firm's fabricated products and its exporting success, in that the

only exporting fabricators were a manufacturer of hydraulic diving handling systems (N) and a highly-diversified firm (L) exporting tubular connectors, down-hole tools, helicopter refuelling systems and diving chambers³ but not its more basic fabrications. Firms K, M, O and P, which manufacture a wide range of unsophisticated fabrications (ranging from flare booms, helidecks and floatation tanks to cargo baskets and bottle racks), have all failed to export their products. Indeed, three of these were not even trying to export, primarily because they realised that their products had very little export potential, while even the fourth, which was actively seeking export orders because it was "desperate" for work, admitted that as a fabricator it was unlikely to win a lot of export business. Finally, although the studbolt manufacturer (Q) was planning to export eventually and was, at the time of the survey, considering starting to export to Norway, it was ...

"only thinking of exporting to Norway because they approached us. We're a new company gradually increasing sales, before we can go after exports we've got to have some sort of domestic base."

Wellhead & Oilfield Equipment

All but one of the manufacturers of specialised oilfield equipment surveyed were supplying offshore markets overseas (while the remaining firm had previously exported offshore-related equipment).

The wellhead equipment manufacturers surveyed were all U.S. subsidiaries heavily involved in exporting. Two of these were trying to develop exports in particular because, as one explained :

"We're not happy with our dependence on the North Sea and we want to become less dependent on it because eventually it'll go on a care and maintenance basis."

On the other hand, the third wellhead manufacturer (V), which has a subsea capability the others do not as yet possess ...

"don't care where the business comes from, we never consider it as exporting, we are worldwide suppliers".

Similarly, firm Y - an established U.K. engineering company which had achieved a certain degree of success in offshore-related markets some years ago but had totally failed in its attempts to break into the offshore markets for subsea equipment (dominated by V) - saw no

3. Firm N2 had also been taken into export markets for the first time through diving system manufacture which, it explained, was "really just all fabrication".

reason to distinguish between domestic and export orders. Nor, for that matter, did W and Z, two subsidiaries of well-known U.S. manufacturers of a wide range of oilfield equipment. For example, one remarked :

"We'll go anywhere they drill. Our pledge is that wherever oil is found we'll be there to offer our capability."

The third U.S. oilfield equipment manufacturer was, however, concentrating on the development of new export markets because "there's not the capacity in the North Sea for us to expand". Finally, it should be noted that the two Scottish down-hole tool manufacturers surveyed had only supplied export markets indirectly, through local (Aberdeen) service companies. Both of these companies were small, and, as one explained ...

"we'd like to export directly but we haven't got a lot of money, we can't afford to."

Process Plant

The U.S. subsidiaries manufacturing ball valves were both heavily involved in offshore markets overseas and both displayed what one of them described as a "worldwide attitude", an attitude shared with a Scottish pump manufacturer (G2) which had won a small number of very sizeable offshore-related export orders.

The remaining firms in this sector are both major process plant manufacturers, but whereas one had supplied pressure vessels and heat exchangers to several offshore markets, the other had proved uncompetitive in the range of process equipment used offshore and the only offshore-related business being undertaken consisted of sub-contracted steelwork for the North Sea, although it was continuing to tender for offshore-related export contracts. The former was also very interested in exporting, having previously neglected exporting in favour of domestic sales :

"We neglected exports while the North Sea was at its peak, but this has diminished and it won't come back so we take what we can".

Power, Electrical & Electronic Equipment

The established power plant manufacturers (H2 and I2) have been exporting motors, generators and switchgear to offshore markets

overseas for some time, and neither distinguished between export and domestic orders. Nor, for that matter, did K2, which had exported communications equipment for use on offshore platforms in previous years and whose failure to do so in the period for which data was collected was not the result of any deliberate policy to withdraw from exporting.

Of the three electronic equipment manufacturers only one was actively developing markets (having already achieved a limited volume of exports of sonar and navigational equipment) :

"We're not going to get volume sales in the North Sea, therefore we're looking for volume in world markets. We've been looking at exporting more and more recently."

The remaining firms in this sector were both small, newly-established Scottish manufacturers of electronic equipment regarded as possessing considerable export potential. Despite this, neither firm was even attempting to export, although both expected to export at some future date after they had first exploited the domestic market for their products.

Summary

Overall the shipbuilders and platform builders surveyed had achieved only very limited exporting success. This, in turn, has repercussions for suppliers of ancillary equipment, especially the fabricators of helidecks, flare booms, floatation tanks etc. which appeared to have little chance of breaking into export markets in their own right (although more sophisticated fabrications such as diving systems did seem to possess export potential). In the field of general mechanical engineering, casing, pressure vessels, heat exchangers, valves and pumps had all been exported, while specialised oilfield equipment (such as wellhead equipment and down-hole tools) had been exported in considerable volume, although this latter sector had remained largely the preserve of U.S. subsidiaries. Finally, all the electrical and electronic equipment manufacturers surveyed appeared to have developed products capable of securing a share of export markets, although several still had to prove that they could market their products effectively overseas.

Thus, this discussion of the exporting activities being undertaken by the sample suggests that the nature of the product may be an

important influence on export performance (with, in general, a positive relationship existing between the degree of product sophistication and export performance and potential).

This section has also contained an examination of the managerial attitude to exporting in each of the surveyed firms (as evidenced by their stated export aims and the export policies they have implemented). A full classification of the export policies implemented by the firms surveyed is provided in Table 9.1.

TABLE 9.1

Export Policies Implemented

Category	Number of Firms
Exporters, of which	
- emphasising export markets	5
- emphasising both export and home markets equally	18
- emphasising domestic market	2
Non-exporters, of which	
- attempting to export	8
- not attempting to export	7
TOTAL	40

SOURCE : Interview data

It can be seen that of the 25 firms which had previously exported offshore-related equipment, 23 had adopted a positive attitude to exporting in that they were either treating export and domestic markets equally or emphasising the development of export markets. The only exporters which had not adopted a positive attitude to exporting were 2 module fabricators, one of which was concentrating on the development of the domestic market while the other had decided to withdraw from the export market altogether. These 2 firms had, in fact, never taken a conscious decision to export but instead had simply filled export orders as and when they had come in, that is,

they had become involved in exporting in the first place almost by accident. As far as the non-exporters were concerned, 8 were attempting to export (indicating a positive attitude to exporting) but 7 were not even trying to break into export markets. Thus, altogether 31 of the 40 firms surveyed had adopted a positive attitude to exporting. The remaining 9 firms were putting little or no effort into the development of the export market, indicating that they had adopted what might be described as a 'passive' attitude to exporting.

When managerial attitude to exporting in each of the surveyed firms was compared with its export performance (measured at its most basic level in terms of whether or not offshore-related exporting had been undertaken), an association between these two factors clearly emerged, as can be seen from Table 9.2 below. For example, while 23 of

TABLE 9.2
Managerial Attitude to Exporting by Export Performance

Managerial Attitude to Exporting	Export Performance		TOTAL
	Exporters	Non-exporters	
Positive	23	8	31
Passive	2	7	9
TOTAL	25	15	40

SOURCE : Interview data.

of the 31 firms to have adopted a positive attitude to exporting had achieved offshore-related equipment exports, only 2 of the other 9 firms had exported offshore-related equipment.⁴ This suggests that a positive attitude to exporting is a necessary pre-requisite for a high level of export performance.

4. And, as was pointed out above (p.163), this was only on a very limited scale.

9.3 MANAGERIAL ATTITUDE TO EXPORTING AND FIRM CHARACTERISTICS, PREVIOUS EXPORTING EXPERIENCE AND FUTURE MARKET TRENDS

In Chapter 5 it was suggested that management's attitude to exporting might be influenced by the capabilities and resources it has at its disposal. For example, management may be aware of the research evidence that indicates that smaller firms tend to be less successful than larger firms in export markets because they do not have the resources required for exporting success. In fact, evidence was found of an association between size of unit and managerial attitude to exporting - most of the units which displayed a passive attitude to exporting were small independent companies employing 150 employees or less.⁵ In addition, none of the firms which had adopted a passive attitude to exporting had any experience whatsoever of offshore markets prior to North Sea developments, suggesting that managerial attitude to exporting may also be influenced by the nature of previous offshore-related experience.⁶ Finally, there appeared to be an association between nationality of firm and managerial attitude to exporting, in that Scottish firms were less inclined to adopt a positive attitude to exporting. Indeed, all but one of the firms which had failed to adopt a positive approach to exporting were Scottish.⁷

Thus, there did appear to be an association between managerial attitude to exporting and certain firm characteristics, specifically size, previous offshore-related experience and nationality. These factors were, however, very much inter-related. For example, it was shown in Chapter 7 that the Scottish firms tended to be smaller than firms of other nationalities, while only one of the Scottish firms had any form of offshore-related experience prior to the development of North Sea oilfields, compared with 17 of the other 24 firms. In fact, with the exception of one large joint-venture unit, the firms which had adopted a passive attitude to exporting were all small or medium-sized Scottish companies, none of which had supplied offshore-related equipment prior to the development of North Sea oilfields.

Management's attitude to exporting might also be influenced by the relative success or failure of its previous exporting experience.

5. See Appendix 9.1 (A)

6. See Appendix 9.1 (B)

7. See Appendix 9.1 (C)

However, there was no clear evidence that the nature of previous exporting experience had influenced managerial attitude to exporting in the offshore-related exporters, although it was interesting that the only exporting experience of the module yard which had decided to withdraw completely from exporting consisted of an extremely difficult contract in the Middle East which had been fraught with problems and which had never been completed.

In the course of the examination (undertaken in section 9.2) of the attitudes towards exporting adopted by the managements of the surveyed firms, evidence was uncovered of the influence exerted by management's perception of present and future market trends. For example, all the exporters emphasising the development of export markets in particular explained that this policy was being implemented because of the constraints which the domestic market imposed on their ability to expand. In addition, two of the (non-exporting) platform yards stated that they would increase their exporting efforts should demand in the domestic market decline (threatening their survival), while the studbolt manufacturer admitted :

"Other than Norway we haven't bothered because there's plenty of business to conquer here first."

These examples indicate that these firms took into consideration the current and expected levels of demand for their products in the domestic market. It was also apparent that as far as the third platform-builder and three of the fabricators of basic items of equipment were concerned, their conscious decision not to attempt to export was largely due to their recognition that it would be extremely difficult, perhaps even impossible, to export the type of equipment they had the capability to produce - that is, in each of these firms, management's assessment of the effective demand for its products in export markets influenced its aims and policy with respect to exporting.⁸

Given the evidence presented above suggesting that several firms did take into consideration the current and expected levels of demand

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8. Management's assessment of the effective demand for its products in export markets will obviously partly depend upon the nature of its products (which will in turn influence transportation costs etc). Hence, in this way, managerial attitude to exporting may be indirectly influenced by product characteristics. Indeed, it should be noted that all the manufacturers of specialised oil technology and process plant had adopted a positive attitude toward exporting, and that most of the units which had not were from a single sector - fabrication.

for their products in the domestic market, one might expect an inverse relationship to exist between the attitude to exporting adopted by a firm's management and its own assessment of the likely future trend in demand for its products in the domestic market. However, for the sample as a whole there was not a clear association between management's perception of the future trend in demand for its products in the domestic market and managerial attitude to exporting. For example, Table 9.3 shows that two of the firms which expected the domestic market for their products to decline had nevertheless adopted a passive attitude to exporting,⁹ while most of the firms which expected domestic demand to increase were nevertheless not content to sit back and exploit this expanding market but instead had adopted a positive attitude towards exporting. This shows that

TABLE 9.3

Managerial Attitude to Exporting by Managerial Perception
of the Future Level of Demand in the Domestic Market

Managerial Attitude to Exporting	Anticipated Trend in Domestic Demand			TOTAL
	Reduced Demand	Stable Demand	Increased Demand	
Positive	13	15	3	31
Passive	2	6	1	9
TOTAL	15	21	4	40

SOURCE : Interview data

management's perception of future trends in demand certainly is not the sole (and probably not even the most important) factor influencing managerial attitude to exporting.

One of the fabricators which was not trying to export argued that there had been no need to export because it had been busy in the domestic market :

9. This apparently inconsistent result is explained by the fact that these two firms were basic fabricators which felt that their products had no export potential.

"For our limited facilities we can find work in the U.K., we're not forced to find markets overseas."

This suggested that in this firm managerial attitude to exporting was influenced by current capacity loading.

Altogether 34 of the 40 firms surveyed were operating below full capacity, while a further two stated that they would expand if they received further export orders. Hence only four firms indicated that their ability to increase export sales of offshore-related equipment was limited, either because they were already operating their plants at maximum capacity and were unwilling to expand in order to be able to accept increased export business, or because production was being restricted by a shortage of several forms of skilled labour (including turners, welders and sheet metal workers). However, there was little evidence of an inverse relationship between current capacity loading and the policy implemented with respect to exporting. For example, the firms operating at full capacity included one of the exporters which claimed to be emphasising the development of export markets and only two of the firms which had adopted a passive attitude to exporting.

Managerial attitude to exporting may, however, be influenced by management's perception of the relative profitability of export and domestic sales. Hence, it may be expected that firms which considered exporting to be more profitable than domestic marketing would have implemented a more aggressive exporting policy than companies which regarded exporting as less rewarding.

Several exporters remarked that it was very difficult to assess the relative profitability of export and domestic sales, while others argued that it was dangerous to generalise since the profitability of individual contracts varied considerably. For example, one firm explained :

"The levels of profit available vary depending on the phase of activity. The high profit is in the exploration phase - this is the side based on personal contacts when you stick to people who won't let you down. Construction brings in a different approach with full tendering and billing and more competitors."

Other comments indicated that purchasing became even more professional

(and cost conscious) with respect to contracts associated with fields at the production phase of activity. Given that the balance of activity in the North Sea has moved from exploration/development to development/production, it is not surprising that most of the 9 firms which considered export orders to be more profitable than domestic sales argued that this was because there was less competition overseas and export markets were less price conscious. The remaining firms which expected exports to be more profitable explained that any export order undertaken would have to be more profitable in order to compensate for the risk involved in exporting, with one firm commenting :

"The mark-ups on exports would be the same as on domestic business plus a 2% contingency factor and this would lead to a higher profit. If exports were less profitable it would probably be because somebody at our end botched it up."

Most of the 7 firms which assessed exports to be less profitable than domestic sales stated that this was because of the additional costs involved in exporting (principally transportation, insurance and agency commissions), although in two cases it was due to a deliberate policy of reducing the profit margin on export sales in order to make export prices more competitive and hence build up export business. The latter firms had thus made a conscious decision to limit short-run profitability in order to increase profitability in the long-run. However, the majority of the sample estimated that there was, or would be, very little difference in general between the profitability of export and domestic sales. Several of these firms argued that this was because offshore oil and gas is an international business dominated by large multinational companies. For example, the diving systems manufacturer explained :

"On diving systems there should be no real difference in price and profitability as we're dealing with the same people whether it is an export or not."

Moreover, further analysis revealed that there was no obvious relationship between the relative profitability of export and domestic sales and export policy implemented. For example, only one of the units which displayed a passive attitude towards exporting was among the firms which judged exports to be less profitable than domestic sales.

Summary

The evidence presented in this section suggests that in many cases managerial attitude to exporting was influenced by certain characteristics of the firm, specifically its size, previous offshore-related experience and nationality. However, it was pointed out that these factors were inter-related and that, in fact, all but one of the firms which had adopted a passive attitude to exporting were small or medium-sized Scottish companies without any form of previous offshore-related experience whatsoever. There was also evidence that in some firms management's perception of the effective level of demand for its products in both the export and domestic markets influenced its attitude towards exporting (and hence, in this way, both the absolute level of demand in these markets and also the nature of the product may act as influencing factors), while in at least one firm current capacity loading influenced export policy. However, overall, there was not a clear association between managerial perception of the future trend in demand in the domestic market and managerial attitude to exporting, nor was there any evidence that in general attitudes towards exporting were significantly influenced by either the current level of capacity utilisation or the perceived relative profitability of export and domestic marketing.

9.4 BENEFITS ASSOCIATED WITH EXPORTING

It was argued in Chapter 5 that management's attitude to exporting might be influenced by its perception of the range and the importance of the benefits associated with exporting its products.

Table 9.4, which lists the major reasons for exporting given by the sample, highlights the different rationale for exporting provided by both exporters and those firms not exporting offshore-related equipment.¹⁰ In particular, exporters tended to stress the desire to achieve growth through exporting, to take advantage of global opportunities and to spread risk, motives seldom mentioned by non-exporters. In contrast, the non-exporters stressed the need to export in order to maintain employment (or, in some cases, survive)

10. As far as the firms which were not attempting to export offshore-related equipment were concerned, Table 9.4 indicates the benefits these firms would expect to obtain from exporting.

TABLE 9.4

Major Reasons for Exporting by Offshore-related Export Involvement¹¹

Reasons for Exporting	Offshore-related Export Involvement		Total ¹²
	Exporters (25)	Non-exporters (15)	
To expand sales; of which	13	14	27
- to grow	(8)	(2)	(10)
- to survive/maintain employment	(5)	(8)	(13)
- to increase profits	(0)	(4)	(4)
To take advantage of global opportunities	8	0	8
To spread risk	7	1	8
Personal motivation, of which	1	5	6
- prestige	(0)	(1)	(1)
- patriotic reasons	(1)	(5)	(6)

SOURCE : Interview data

and benefits - such as patriotism and the ability to increase profits by increasing turnover through exporting - considered unimportant by exporters.

Given that a large majority of the sample were operating at less than full capacity, it is not surprising that by far the most common reason for exporting was the desire to increase sales. For several firms, most of them exporters, exporting offered the opportunity to expand when this was impossible, or at least more difficult, in the domestic market. However, a slightly larger number of firms, mostly non-exporters, regarded exporting not so much as a way of achieving growth but rather as a means of avoiding decline (and hence redundancies). The following comment was typical of the remarks made by the exporters :

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11. A full classification of all the reasons given for exporting by the sample is provided in Appendix 9.2.
12. Although the figures shown in the 'total' column equal the sum of each row, the columns cannot be totalled as some firms provided multiple responses.

"If we didn't export we couldn't exist, exports allow us to continue to survive - we have a responsibility to those people we employ."

The situation was even more serious for the firms which viewed exporting as a means of survival but which had failed to win export orders. Finally, a few firms regarded exporting as a way of increasing profit through increased turnover, in that "if you're increasing turnover you must be increasing profit."¹³

The fact that many firms were either exporting or trying to export, because the level of domestic demand limited growth (and in some cases, threatened survival) provided further evidence that managerial attitude to exporting may be influenced by management's perception of the level of demand in the domestic market. Indeed, the extent of this evidence is such that it appears to seriously contradict the conclusion reached at the end of section 9.3 that in general attitudes towards exporting did not appear to be significantly influenced by either the current level of capacity utilisation or management's perception of the future trend in demand for its products in the domestic market. However, although the majority of firms exported, or attempted to export, in order to expand sales beyond the level possible in the domestic market, it may be that for many firms this was just one of several exporting motives (of which it may not even have been the most important).

In contrast, there is no doubt that to 8 exporters the desire to take advantage of global opportunities (that is, to satisfy the demand for their products emanating from offshore markets overseas) was vitally important, in that all of these units mentioned only this motive for exporting.¹⁴ It should be noted that most of the firms to stress this motive for exporting were U.S. subsidiaries.

Several firms stated that exporting was undertaken in order to spread risk and increase flexibility, the following statement being typical of the kind of reasoning used :

"The advantage of exporting is mainly in terms of the spread of geographical risk. The North Sea is in oilfield terms a stable zone of activity but it's highly dangerous to be reliant on that one area."

13. This may not, of course, necessarily be the case.

14. Hence, the managerial attitude to exporting in these units was clearly influenced by the level of effective demand for their products in export markets.

The only non-exporter to mention this motive explained that the risk could stem from either a downturn in the market or a change in the government legislation affecting the North Sea, and that it would therefore be advantageous to export and hence broaden its customer base. The fact that market diversification could also reduce the variability in sales produced by the seasonal nature of North Sea demand was also mentioned by a few firms, one commenting :

"With the weather window in the North Sea we're busy in the summer but fairly dormant in winter, exporting more we could even out the bumps."

It was noticeable that all the firms which mentioned risk-spreading were either Scottish or U.K. owned and it seems likely that for the U.S. companies (and perhaps also the joint-ventures) this motive was less important because, with plants located throughout the world serving a large number of offshore markets, these companies had already spread the risks affecting their activities.

Among the motives for exporting less often mentioned was the desire to monitor global competition (and avoid the complacency which might result from operating purely in the domestic market), the following comment being representative of the explanations provided:

"Exporting means contact with developments in other markets. The North Sea has been the laboratory but won't remain so for much longer with Australia, Newfoundland and Alaska, where the climate is even more demanding than the North Sea."

While in this way exporting may result in the introduction of new techniques and/or products, one firm argued that exporting could lead to product improvement simply by increasing sales volume and allowing movement along the 'learning curve':

"Volume sales can help you improve your products. For example, we built 3 scanning sonars but at the time the quality left something to be desired. Recently we've done a batch of 10 which are superior."

In addition this firm had, through exporting, reaped the more usual economies of scale, namely reduced cost (and hence more competitive pricing). A few firms felt that exporting 'proved' or would 'prove' their capability and competitiveness and improve their reputation in both domestic and export markets, the following explanation being typical :

"Exporting affects the view that the world market has of your capability. Operating not just in a closed market in which business was put your way by the government suggests you are more capable. If you're getting export contracts you're obviously competitive - in reputation terms exporting provides some benefits."

While one firm was hoping to export directly because exporting was expected to be easier (since export contracts would allow a longer time for production than domestic orders which were usually required at very short notice), a small number of exporters indicated that they were exporting because exports were more profitable than domestic sales as there was less competition in overseas markets. The relative unimportance of the latter motive is consistent with the evidence presented earlier that most of the sample considered that there was, or would be, very little difference in general between the profitability of export and domestic sales.

Typical of the comments suggesting that the personal motives of a firm's senior personnel might influence export policy was the following :

"The Chairman might like the Queen's Award for Industry so he might push from the top (and) we would help the balance of payments and get foreign currency, and I suppose we have a moral obligation to export because Britain survives through exporting."

However, none of the firms which suggested this motive implied that it would be the sole or even the most important reason for exporting and all provided additional explanations of their policy towards exports. Hence, it seems likely that personal motives would normally be of only secondary importance.¹⁵

Thus, most firms argued that they were exporting (or would export) for sound, commercial reasons, with only the studbolt manufacturer admitting to being drawn into exporting without giving the matter due consideration and without having made a conscious decision to export.

15. It should be noted that most of the firms which mentioned personal motives were non-exporters which therefore had no actual experience of the benefits of exporting. Indeed, as far as the firms stressing the patriotic aspect of exporting were concerned, this may have been an example of respondents saying what they thought they should say.

Nevertheless, as has already been pointed out, Table 9.4 suggested that there was an association between the nature of the reasons given for exporting and export performance (measured in terms of whether or not offshore-related equipment had been exported). Moreover, it should be noted that 6 of the 8 major offshore-related exporters (with export sales of offshore-related equipment of £1 million or more per annum) and 4 of the 7 firms with the best offshore-related export performance (that is, those firms exporting over one-third of their offshore-related sales) gave as their sole motive for exporting the desire to take advantage of global opportunities. Thus, there appeared to be an association between exporting being undertaken for 'aggressive' motives - such as the desire to achieve growth and, in particular, the desire to take advantage of global opportunities - and successful performance in offshore-related export markets.

Evidence was also found that managerial attitude to exporting might, in some cases, be influenced by management's perception of the benefits associated with exporting. For example, all but one of the firms to mention the desire to take advantage of global opportunities had adopted a positive attitude to exporting, while personal motives and the wish to expand sales for survival and profitability purposes were stressed by more passive firms than would normally be expected given the small number of firms which had adopted this type of attitude to exporting. However, for the sample as a whole there was not a strong relationship between the nature of the reasons given for exporting and managerial attitude to exporting. Thus, although the reasons given for exporting were not, in general, a particularly good indicator of managerial attitude to exporting (perhaps because they represent just one of several groups of influential factors), those firms exporting for aggressive motives did tend to be the most successful exporters.

Further analysis revealed that significant differences existed in the motives for exporting mentioned by firms in different product groups.¹⁶ In particular, while the manufacturers of specialised equipment stressed the desire to take advantage of global opportunities and to expand through exporting, and the electrical/electronic

16. Appendix 9.3 provides an analysis of the major reasons for exporting by product sector.

equipment manufacturers emphasised growth and the importance of spreading risk, to the process plant manufacturers and the manufacturers of the major items of offshore equipment the most important reason for exporting was to continue to stay in existence.

Finally, there were also one or two important differences in the motives for exporting suggested by firms of different nationality. For example, it was noticeable the majority of the firms to state that they were exporting for the sole (aggressive) reason that they wished to take advantage of global opportunities were U.S.

subsidiaries. (However, once again it should be borne in mind that most of these U.S. subsidiaries were manufacturers of specialised oilfield equipment and that therefore the findings concerning exporting motives by product group and by nationality are not independent).

Summary

Thus, the benefits associated with exporting suggested by the sample were found in many cases to be influenced by firm nationality and product-mix. However, in general, there was not a strong relationship between exporting motives and managerial attitude to exporting (perhaps because management's perception of the benefits of exporting was just one of several groups of factors influencing its attitude towards exporting). In contrast, a clear association was discovered between the nature of the motives for exporting suggested by the surveyed firms and export performance, in that firms which exported for aggressive motives tended to be the most successful exporters of offshore-related equipment.

9.5 SOURCES OF COMPETITIVE ADVANTAGE

The desire to take advantage of global opportunities was the nearest any firm came to explaining its motives for exporting in terms of a desire to exploit a comparative advantage held over global competitors, which is, according to the classical theory of international trade, the main motive for exporting. However, it was suggested in Chapter 5 that manufacturers with experience of supplying the North Sea market may hold a comparative advantage over their international

competitors. Evidence as to the nature of this supposed comparative advantage will now be discussed.

Table 9.5 (below) provides an indication of the relative importance of the major factors suggested as comparative advantages by the sample,¹⁷ although this is a simplified picture given that these will vary in different circumstances, as one firm explained :

"Sometimes it's price, sometimes it's quality, sometimes reputation, sometimes technology ... it's getting the correct combination of factors that's important."

In addition to one firm which considered that it held an advantage in "technical competence" and another which believed its strength lay in its "technical expertise", 14 firms claimed to have developed technically superior products, although several emphasised the need for continual product development in order to stay ahead of competitors. Furthermore, some of these firms still have to prove that they have the ability to market these products effectively, while there is also a danger that technological development may become an end in itself with the result that what appear to the manufacturer to be technological advances may not represent better solutions to its customers' problems. For example, a failure to relate product development to the market's needs is evident in the following statement by an electronics manufacturer :

"Nobody else is in our business. We have technological products nobody else makes so we are trying to create a market."

Not all of these superior products owed their development solely to North Sea experience, as one U.S. subsidiary made clear :

"Our equipment has been developed over the last 40 years for a specialised use. During this time so many 'bugs' have appeared and been solved that our equipment must be good, because of the technological know-how we've built up over the years."

However, most firms emphasised the importance of North Sea experience and indeed, detailed analysis of the respondents' replies indicated that it is doubtful whether any of the dozen Scottish/U.K. firms which claimed to hold a technological advantage would have developed this without the stimulus of the North Sea market.. The same

17. A full classification of all the comparative advantages suggested by both exporters and non-exporters is provided in Appendix 9.4.

TABLE 9.5

Major Comparative Advantages by Product Sector

	Product Sector					Total (40)
	Shipbuilding; Platforms; Steel, Pipe & Pipe- Coating (8)	Underwater Eng'g; Modules; Fabrications; Sub-contracting; Metal Goods (12)	Wellhead & Oilfield Equipment (9)	Process Plant (5)	Power, Electrical & Electronic Equipment (6)	
Comparative Advantages						
Track record/reputation	4	3	4	3	3	17
Product expertise	2	2	3	3	6	16
Size of firm	2	2	2	1	3	10
Delivery	1	3	1	3	1	9
Industrial relations	0	1	3	1	3	8
Skilled labour force	1	1	2	2	1	7
Price	1	2	0	2	2	7
Market knowledge/contacts	1	2	1	2	1	7
None	0	5	2	0	0	7

SOURCE : Interview data

applies to firm V, a U.S. wellhead manufacturer, which only developed its subsea capability as a result of North Sea involvement. In fact, this firm argued that its technological advantage with respect to all its products stemmed from its lack of previous offshore experience :

"The equipment used offshore is twice as big and heavy as it needs to be. Competitors developed it from onshore equipment, nobody sat down and designed offshore equipment. Being a young company we did, we developed systems primarily for offshore use."

It can be seen from Table 9.5 that all the manufacturers of electrical/electronic equipment claimed to possess an advantage with respect to product/expertise. In contrast, none of the firms in the fabrication sector claimed a product advantage with respect to fabrications,¹⁸ while none of the shipbuilders or platform fabricators alleged that they held an advantage in terms of either product or expertise. This result is consistent with the previous evidence that certain fabricators (including one of the platform yards) were not even attempting to export because they realised that their products had very little export potential,¹⁹ and also with the conclusion that all the electrical/electronic equipment manufacturers appeared to have developed products capable of securing a share of export markets and that in general there was a relationship between product sophistication and export potential.²⁰

Nearly half the sample stated that they held an advantage over their competitors in terms of their 'track record' and/or reputation. The importance of this factor is evident from the following statement by one of the U.S. subsidiaries :

"Our customers ask for our ball valves by name and we are usually the most accepted even if we are the most expensive."

A few of the firms which claimed an advantage of this type had started to build up their reputation well before the development of the North Sea. However, for the vast majority North Sea involvement had been vital in allowing them to establish their credibility to the extent that they now regarded their track record in the North Sea as providing them with a comparative advantage over international

18. Although the highly-diversified firm L claimed that some of its non-fabricated products were technically superior and firm N believed it held an advantage in "technical competence".

19. See p.162 and 164.

20. See pp. 166-167.

competitors. Moreover, a number of firms stressed that the North Sea was in fact the ideal area in which to prove one's capability and several specifically mentioned that this advantage should lead to success in export markets, the following explanation being typical of the reasoning used :

"With our experience in the North Sea we should be able to get orders overseas. The question our customers ask is 'where has it been used?'. We've got credibility if it has been used in the North Sea, especially by the majors like BP who are known throughout the world."

Several exporters claimed to possess an advantage in terms of market knowledge or established contacts. Once again, Scottish companies had developed these contacts through their involvement in the North Sea, as one explained :

"The same people evaluating diving systems manufacture in the North Sea evaluate diving systems in other areas. Therefore we don't have any marketing problems, we know the people."

However, two U.S. subsidiaries manufacturing down-hole tools (which tend to be purchased on a more local level) stressed the importance of having contacts established throughout the world :

"The trick is to get in and get specified. For example, with the Saudis we know people who will tell us the project is underway before the OSO knows about it."

Some firms commented upon the importance of purchasing inertia. While a few considered that they held an advantage in certain markets - Canada and the Middle East being mentioned - which traditionally purchased from U.K. companies or were at least orientated towards British standards, one firm also pointed out that once established with a particular customer inertia will work on one's behalf :

"If somebody has your equipment and they go for an extension then you're in a good position unless you've let him down. Also, they go for your spares and come to you to service your own equipment."

Of the firms which believed that their size gave them a comparative advantage in export markets, half argued that being a large organisation was advantageous. The actual benefits large size was considered to bestow were increased flexibility (resulting from the ability to redistribute orders among the company's various plants),

the ability to draw on the expertise of the rest of the group and greater financial backing (allowing, for example, better credit arrangements to be offered to customers). The fact that large companies considered that their size and, in particular, their greater financial resources provided them with a comparative advantage over their competitors is consistent with other evidence that size is an important advantage in export markets.²¹

All but one of the firms to allege that small size was advantageous were Scottish. Generally speaking, the suggested benefits of small size were somewhat less tangible than the alleged advantages of large size. While small size was considered to confer the ability to respond quickly to both customer inquiries and problems and to changes in demand, the ease of co-ordination and control in a small company was also emphasised :

"We're small and the right hand knows what the left hand is doing. Everybody knows what's going on. We take a big project one at a time and we all know what's happening, the big operators don't."

One firm argued that in a small company the identify of interest between employees and the firm could be sustained, resulting in fewer morale problems and providing advantages worth protecting :

"Growth into a large company or takeover by one is not in the interests of the firm or the employees, as we would lose our identity. In a small company when an engineer designs a piece of equipment it's almost as if he's got his name on it and if it goes wrong he'll drop everything and open it up to see what's wrong with it - it's pride."

The absence of industrial relations problems was also specifically mentioned as a benefit of small size by one firm and, in fact, small firms accounted for the majority of the companies which mentioned good industrial relations as a comparative advantage (although, in effect, only one firm argued that 'good industrial relations' meant anything more than simply the flexibility of operation allowed by non-unionisation). Several stressed the great importance of this flexibility, the following explanation being typical of the reasoning used :

"Non-unionisation is the biggest advantage. What you've got to understand about the petroleum business is that you

21. See for example, pp. 250-251.

need the ability to react and serve quickly. We need to be flexible. We have no rigid job classification structure and we can work overtime when we want to and so on."

Thus, non-unionisation and good industrial relations apparently allow flexibility of operation, which in turn seemingly yields important benefits in terms of speed of response and, according to one firm, reliable delivery :

"We meet deliveries because of our labour force. We're 40 miles from Aberdeen, and we're pulling from a rural community with no background of industrial disputes."

Several of the firms which claimed to hold an advantage in terms of either speed or reliability of delivery stressed the vital importance of these factors to the oil industry. Typical of the arguments used by the firms emphasising the importance of being able to meet promised delivery dates was the following comment by a module fabricator :

"The key to everything, the philosophy behind the whole operation is that we must deliver on time, it doesn't matter how we do it. Delivery has got to be the biggest thing, late delivery of a module could throw them out 6 to 9 months, which could be very expensive."

Representative of the firms which claimed to be superior in terms of their speed of delivery was the following :

"The oil business doesn't plan too far ahead. We got two weeks notice of £180,000 of wellheads. They rely on our ability to deliver and up to now it's been good, that's why we've made inroads into our competitors, we could supply and they couldn't."

Although one firm stressed that "you don't have to have the lowest price, you need to be technically compliant and be able to sell once you've got the bid in," a price advantage over competitors was alleged by several firms, some of whom explained that this was mainly the result of their labour costs being considerably lower than those of, for example, their Norwegian and American competitors. In addition, a few firms allegedly held an advantage in terms of their ability to take part in a 'package deal' offered to countries requiring financial aid :

"We've got to tag along with others in a package providing know-how (usually from the operator), aid (government-backed) and credit. Therefore we take along a bank which is prepared to work out a deal shaded towards their ability to pay."

U.S. subsidiaries considered that a U.K. location aided entry into the E.E.C. and Commonwealth markets (by reducing customs and other difficulties), allowed access to U.K. financing (directed, in particular, at the old Commonwealth countries such as India), and reduced transportation costs (by reducing the distance between the manufacturing plant and, for example, the Middle East). British companies mentioned either their location's contribution to the absence of industrial relations problems or the availability of skilled labour in their area. Finally, superior facilities and marketing orientation were factors considered by a few firms to provide them with an edge over their international competitors (although it is likely that many other firms took marketing orientation for granted).

Summary

A number of factors were suggested as a source of comparative advantage, the most important being product/expertise and track-record/reputation. Many of the companies mentioning these two categories of comparative advantage were Scottish or U.K. firms, for most of whom involvement in the North Sea market had been absolutely essential to the development of their offshore capability. The firms claiming a product advantage included all the electrical/electronic equipment manufacturers but none of the shipbuilders or platform builders, nor did any of the fabricators claim a product advantage with respect to their fabricated products. Moreover, it was noticeable that most of the firms which admitted that they held no special comparative advantages over their international competitors were from the fabrication sector. Hence, this analysis has provided further evidence of a possible association between the nature of the product and export potential. Generally speaking, however, there was not much difference in the nature of the supposed comparative advantages held by firms of different nationality, although size of firm did appear to have some bearing on the nature of comparative advantages allegedly held.

Further analysis revealed that there was some evidence of an association between the nature of the comparative advantages claimed by a firm and its management's attitude to exporting. For example, the comparative advantages most often mentioned by the firms which had adopted a passive attitude to exporting were those of small size (principally good industrial relations) and very few of the passive firms mentioned the track record and product advantages which

were easily the most frequently referred to by the firms which had adopted a positive attitude to exporting.

Finally, exporters in general claimed to hold more comparative advantages than did non-exporters.²² Moreover, the exporters most heavily involved in export markets (in both relative²³ and absolute²⁴ terms) claimed to have more comparative advantages than did less successful exporters. These results indicate the existence of an association between the number of alleged comparative advantages and export performance. (They also suggest that there was a considerable element of truth in the responses provided by the sample concerning the comparative advantages allegedly held.)

9.6 PROBLEMS ASSOCIATED WITH EXPORTING

There were some significant differences in the nature of the exporting problems²⁵ mentioned by firms in different product sectors²⁶ and also firms of different size. These differences will be highlighted in the discussion of exporting problems which follows.

Almost half of the sample mentioned visible trade barriers - such as tariffs and domestic content regulations - as an exporting problem. For example, one of the shipbuilders pointed out that many countries (including Canada, South Africa, Brazil, Singapore, Mexico and the U.S.A.) provide their domestic shipbuilding industries with subsidies of 25% or more. All but one of the process plant manufacturers also considered visible trade barriers (primarily tariffs) to be a problem, with India, Australia, Yugoslavia and especially South America (where tariffs in general are high due to the LAFTA agreement) being singled out for special mention. In addition, one of these firms pointed out that often support for local industry was 'hidden' and that even within the E.E.C. there was a great deal of protectionism :

22. See Appendix 9.5

23. See Appendix 9.6 (A)

24. See Appendix 9.6 (B)

25. As far as the firms not attempting to export offshore-related equipment were concerned, this section analyses the exporting problems these firms would expect to encounter.

26. See Table 9.6 (below) which analyses the major exporting problems. A full list of all the exporting problems suggested by the sample /

"Where you get countries like Spain and Italy in trouble and strife politically their governments try to keep people employed, therefore they have hidden subsidies. Also more happens with respect to subsidies than you think. For example, the French shipyards are subsidised - subsidies for shipbuilding are allowed but they are being used for building pressure vessels in competition with us."

It was the less obvious forms of protectionism which the platform builders and fabricators had generally encountered, particularly with respect to the Norwegian market. For example, one fabricator remarked :

"We spent weeks preparing a quotation for Norway for nothing. We don't know if they were seriously considering us or just going through the motions of asking us to quote."

Although three of the electrical/electronic equipment manufacturers mentioned visible trade barriers, for two firms these were only regarded as a problem with respect to the U.S. market, while for the third Norway was a difficult market (but only with respect to products already manufactured in Norway). Similarly, although all the wellhead manufacturers experienced problems with respect to domestic content regulations, this was only in countries (such as Mexico and Norway) where their competitors had established plants from which the state oil companies tend to order direct. Finally, the relatively unsuccessful firm Y was the only oilfield equipment manufacturer to mention visible trade barriers as a problem.

Thus, while the shipbuilders, fabricators and process plant manufacturers faced fairly widespread visible trade barriers, the electrical/electronic equipment manufacturers apparently only experienced this problem in the more sophisticated markets of Europe and North America, and the manufacturers of specialised oil technology only in markets where competitors had undertaken direct investment. Hence, although not obvious from Table 9.6, there was an association between the significance of visible trade barriers and the nature of the product, with sophisticated and/or specialised items of equipment being relatively free of the constraints imposed on export potential by visible trade barriers. Given this association it was no surprise

/ is provided in Appendix 9.7, while Appendix 9.8 provides details of the factors which the 25 exporters of offshore-related equipment expected to constitute additional exporting problems at some time in the future.

TABLE 9.6
Major Exporting Problems by Product Sector

Exporting Problems	Product Sector					Total (40)
	Shipbuilding; Platforms; Steel, Pipe & Pipe- Coating (8)	Modules; Fabrications; Sub-contracting; Metal Goods; Underwater Eng'g (12)	Wellhead & Oilfield Equipment (9)	Process Plant (5)	Power Electrical & Electronic Equipment (6)	
Additional costs & problems of overseas marketing	3	6	6	4	4	23
Visible trade barriers	3	5	4	4	3	19
Inaccessibility of markets	5	6	2	3	1	17
Payment problems	4	5	5	1	2	17
Invisible trade barriers	3	2	5	3	2	15
Purchasing inertia	2	1	4	3	3	13
Prices uncompetitive	5	1	3	3	0	12
Export subsidies	3	3	0	2	1	9
Size/Limited resources	0	4	2	0	3	9
Politics	2	3	1	1	2	9
Currency fluctuation	0	2	3	2	1	8
Productivity	4	1	1	1	1	8
Raw material & labour supply	0	2	4	1	0	7
Restricted export markets	3	1	2	0	1	7
Unsophisticated product	3	3	0	0	0	6
Delivery	2	1	2	1	0	6

SOURCE : Interview data

to find that the majority of the companies to argue that the unsophisticated nature of their product was a disadvantage in export markets were among those to mention visible trade barriers. Further evidence of the consistency of these qualitative results is provided by the fact that the firms arguing that the unsophisticated nature of their product represented an exporting problem included all but one of the companies which had previously explained that they had adopted a passive attitude to exporting because they recognised that it would be extremely difficult, if not impossible, to export the type of equipment which they had the capability to manufacture. The firms to stress the unsophisticated nature of their products as an exporting problem were all in the area of fabrication and sub-contracting (including all the platform fabricators). Typical of the reasoning used by these firms was the following comment :

"Our products have no unique aspect, no sophistication, there's no export potential."

The invisible trade barriers referred to as exporting problems fall into one of two categories - corruption and (the more frequently mentioned) administration and customs difficulties. The firms to express concern about the problem of corruption in export markets singled out Africa and the Middle East for special mention. While one firm commented that in the Middle East "bribing is necessary or your loads are dropped at the docks or not picked up", another stressed that bribery of officials with responsibility for purchasing decisions was also necessary :

"The Middle East is the land of the greasy palms. It's a very, very difficult market for us. We are a slightly old-fashioned, well-established company and we didn't operate a slush fund or splash money around, the directors were a bit naive in that respect. Anybody who thinks they can get business on the strength of their performance is wrong. Your agents have got to look after the right parties."

This was indeed the way in which one of the U.S. subsidiaries dealt with the problem :

"We use agents, you've got to have them in the Middle East where there's a lot of baksheesh. We pay the agent commission and what he does with it is his own business. You can't have your own people dishing it out."

Several firms referred to the customs and administration difficulties associated with exporting, including excessive export documentation. For example, one firm stated that it had to supply Turkey with 20 original copies - no photocopying was allowed - of all invoices and test certificates. Some firms stressed in particular the problems associated with letters of credit, highlighted in the following remark :

"It takes us 2½ months to establish a letter of credit and when we receive it it must be word perfect in order to receive the money. If there are any differences between the order and the conditions on the letter of credit - for example, differences in the shipping arrangements - then legally the bank can't pay up."

The inaccessibility of export markets was also frequently suggested as an exporting problem. Some firms argued that inaccessibility resulted in communication problems which make exports more difficult to control. However, inaccessibility can also be in terms of distance (which affects transportation costs) and modes of transportation (which can result in transportation difficulties and hence delivery delays). Problems associated with market inaccessibility were mentioned by all the platform builders and half of the fabricators, but by only one of the electrical/electronic equipment manufacturers and only two of the wellhead and oilfield equipment manufacturers. This suggests that the inaccessibility of export markets is another exporting problem of much greater significance to manufacturers of unsophisticated products than it is to exporters of specialised, high-value/low bulk items of equipment (for whom transportation costs are relatively unimportant).

Nearly half the sample mentioned problems associated with receiving payment on export contracts. Several firms stated that they had completed contracts for which they had never received any payment (with Nigeria, Mexico and Iran being the countries involved), while others had, on occasion, not received full payment. In addition, some firms had been involved in export contracts where a shortage of foreign exchange in the importing country had resulted in the exporter being pressurised to accept a counter-trade agreement, with the following being a typical example :

"We got a very big contract in Algeria. We had to involve our bankers because of the problems we had. Algeria wouldn't let the currency out of the country, we could have payment in oranges, in camels, but not in sterling."

Finally, several firms commented upon the period of time - often six months - that sometimes elapsed before payment was received on export contracts, particularly in cases where letters of credit were used.

Political factors may also provide problems with respect to exporting. While one U.S. subsidiary was prohibited by the U.S. government from signing contracts with Iran, another criticised U.K. government-imposed restraints on trade with countries such as South Africa. Some firms believed that the political situation in general was worsening :

"The international market available to British manufacturers is shrinking. For example, you can't sell to China if you've sold to Taiwan; Iran is no longer available; Nigeria has been upset by the British; Chile is out of order; and Israel is a no-go area if you want to export to the Arab countries."

However, it was also pointed out that even a change of government in an overseas country could result in a contract being withheld.

It has already been shown that some firms considered that they held an advantage in certain markets which traditionally 'buy British', while others argued that as they were now established in the oil business inertia would start to work on their behalf.²⁷ However, a much larger number of firms regarded purchasing inertia as a problem. Roughly half of these firms referred to the difficulty of entering markets which were traditionally supplied by firms of other nationalities, as one explained :

"Our competitors have their own area preferences, just like our Commonwealth."

Among the traditional supply links mentioned were France's ties with Abu Dhabi and her African colonies, Belgium's links with her African colonies and the U.S.A.'s sphere of influence in Canada, Mexico and South America. Other firms mentioned source loyalty in export markets as a problem. For example, one firm admitted :

27. See p. 184.

"As far as our low pressure products are concerned, our competitors have been established longer and therefore they have the edge."

However, this same firm went further to argue :

"The oil business as a whole is American-orientated and a lot of American influence is incorporated into the specifications. This means we are always putting forward options of British specifications against American specifications. They are compatible in some cases but we always struggle to match American specifications."

Several firms mentioned currency fluctuation risks and, in particular, the impact which exchange rate fluctuation can have on the profitability of exports, a typical comment being :

"You quote in yen, marks or dollars, and you're worried you haven't allowed sufficient room for changes in exchange rates. There can be up to a 120-day quote period, so it gives us a lot of sleepless nights."

In addition, a few firms stated that the absolute value of sterling was a problem in that it contributed to making them uncompetitive in export markets,²⁸ while several others explained that it was for this reason they were worried about the future movement of the pound.²⁹ The following remark provides a clear explanation of this problem :

"Everybody converts to dollars. We were quite happy at \$1.90 but it's now \$2.30 which means our prices have gone up a tremendous amount, 25-30% has gone on our prices through no fault of our own."

All but one of the firms which claimed that their international competitiveness was being harmed by the poor performance of their raw material suppliers singled out the British Steel Corporation for special mention. BSC were criticised for both the price and quality of their steel and also the unreliability of their deliveries.

It has already been pointed out that a number of firms believed that either their skilled labour force or good industrial relations provided them with an advantage over their international competitors (with, in several cases, these competitive advantages being

28. One U.S. subsidiary stated that for U.K. manufacturing industry to be competitive the pound would have to be worth no more than \$1.50 (at a time when it was valued at \$2.30).

29. See Appendix 9.8.

associated with the location in which these firms had established their manufacturing plants).³⁰ This evidence is consistent with the fact that only one firm regarded its (very unreliable) labour force as a problem which would affect its performance in export markets, although two other firms argued that their ability to compete in export markets was adversely affected by their high-cost locations (in Aberdeen and a remote area of north-west Scotland) to and from which transportation costs of raw materials and finished products were considerable.

Several firms (including all the shipbuilders) claimed that their ability to compete in world markets was being impaired by export subsidies provided by overseas governments (including France, Holland, Canada, Sweden, Finland, Italy, Spain and Japan). In addition, a few firms also complained that the support given by the U.K. government to exporters was insufficient.³¹ Finally, an inability to provide credit at rates comparable with those offered by international competitors was mentioned by three firms, the same number of companies which claimed to hold an advantage in terms of credit provision.

Although a number of factors such as the value of sterling, overseas government export subsidies and inadequate performance by suppliers were mentioned as contributing to the uncompetitiveness of the sample in world markets, several firms admitted that their own low productivity was also partly responsible. Indeed, the rig-builder described productivity as ...

"our biggest problem. We build a first-class rig but productivity is considerably lower than in the States. It takes almost twice as many man-hours to build a rig over here, although the rate per hour is higher over there. Overall, the effect is an ex-yard cost of \$4½ million more out of here than the States."

Most firms stated that their inefficiency was due to a number of factors, with the following being typical of the explanations provided :

"The facilities are out of date. We have installed new machines but the sophistication is not all the way through, so we get bottlenecks. We have a £70 million

30. See p. 187. It should also be noted that a shortage of skilled labour was responsible for restricting production in only one of the 40 firms surveyed.

31. The utilisation of the government's export services is discussed in more detail in the following chapter, pp. 239-243.

capital investment plan over the next 10 years providing we get guarantees from the work force to accept certain flexibilities. We are buying up their 'allowances', including pay awards for reduced manning levels. We have basically a lazy workforce from management to shop floor. Their basic attitude is wrong, they only work 4 hours a day. We have poor management, we're not well organised - the organisation of the work as it goes through the shops - we might only get 20 hours work on something in 2 weeks."

Three of the firms to mention low productivity were part of, or associated with, a nationalised industry. Certainly as far as one of these firms was concerned, this was a major cause of its productivity problem :

"Our base capability is now 520 employees, but at one time we had 1200 wrapped around our necks - we had this 'social responsibility' drivel."

Thus, a number of factors contributed towards price uncompetitiveness in export markets, which itself was mentioned as a problem by double the number of firms which allegedly held a comparative advantage in terms of price. However, the significance of price uncompetitiveness as an exporting problem varied by product sector, as can be seen from Table 9.6 (above). For example, none of the electrical/electronic equipment manufacturers mentioned this problem, while the only manufacturers of specialised oilfield equipment which did were two Scottish/U.K. firms and a single U.S. subsidiary for which this situation was temporary in that it had arisen only because its major international competitors were "undercutting just to keep their factories open". On the other hand, the situation was more serious in the general engineering sector where one firm admitted that it was a lot dearer than its foreign competitors and therefore only won export orders when they couldn't meet delivery dates, while another explained :

"In straight competition the Japs will 'take us to the cleaners'. We don't get a lot of business in the Middle East because they deal in cash and go for the lowest bid. Therefore I deal with all the bankrupts, such as Egypt and Turkey."

However, inability to meet international price competition was most serious in the shipbuilding industry, where the full extent of the problem was made evident by one shipyard's comment that "our cheapest competitor is a Korean yard which is half our price." Moreover,

even with respect to sophisticated, multi-purpose support vessels the position was not a great deal better :

"Even if 10 are required for the North Sea it is unlikely that we will build any of them on a price and delivery basis alone. It's up to the government to say if we take the order."

Two of the shipbuilders were also among the firms to admit to having difficulties in matching the delivery dates quoted by their competitors (partly as a result of inefficiency). Several firms regarded as a problem the fact that they were restricted from exporting to certain markets under the terms of a licensing or joint-venture agreement, or because these markets were served by another subsidiary of the same group. One firm explained the significance of this type of restriction in the following way :

"The first and most important thing is to renegotiate the terms of the agreement. This is the crux of the whole thing. We're restricted to European waters. If we get agreement to relax that element then exports will take off."

Although a few small firms commented on the advantages which small size can bestow, a somewhat larger number of firms (all but one of which were Scottish) argued that small size was a factor which adversely affected their export potential. For example, for the small electronics firms investment in R & D was seen as a priority, with the result that there was little finance available for expansion, as one explained :

"Our only problem is it's heavy finance, we refuse to let it run away with itself. We could expand to produce massive exports - there's a huge market for this equipment - but this would take our resources away from more development. It's a trade-off situation because we're totally self-financing you see."

A few firms argued that being small companies they lacked management depth with the result, for example, that "you don't think about the future, you're too bothered with day-to-day problems". Finally, one firm explained that exporting was a particularly costly exercise for a small company :

"It's the chicken and egg situation, particularly in the oil business where there are high costs with respect to entertaining, hotel bills, etc. To send a chap to the Middle East for a fortnight is costly."

Thus, this evidence is consistent with the theory that small firms may be at a disadvantage in export markets in that they may not possess the resources necessary for the successful exploitation of overseas markets.³²

In fact, over half the sample mentioned as a problem the additional costs and difficulties of overseas marketing, with several firms commenting specifically on the cost of overseas selling, the following comment being typical of the responses provided :

"We can't afford to export because of the cost of overseas travel and so on. Two trips to India cost me £4,000 for nothing. We need salesmen which we can't afford."

However, overseas selling was also considered expensive by large companies, one of which believed that an export sales team of 5 was as much as could be afforded given the fact that overseas salesmen "consume money at a great rate." While the difficulty of collecting appropriate information about overseas markets and the greater cost of tendering for and negotiating export contracts were referred to by a few firms, ten companies mentioned the problem of supporting export markets. Several firms argued that the only solution to the latter problem was the provision of service facilities overseas (either by establishing their own service bases or by appointing agents to undertake servicing for them) as it was too expensive to send U.K. personnel overseas to undertake maintenance and repair. However, one firm pointed out that there were cases where the cost of overseas support might prove prohibitive :

"In Nigeria the business available is just not profitable considering what we would have to do to get it - they want a service base set up - so we're not interested."

In addition, several firms stressed that agency relationships can cause problems.³³ For example, while one exporter remarked that "you never know if an agent is doing a good job and it's difficult to keep an eye on them", one non-exporter considered that :

"getting the right agent is probably the most important problem. We'll be talking to an awful lot of people before we decide."

32. Further evidence suggesting that small firms may not be able to afford to utilise the most appropriate export marketing methods will be discussed in the following chapter.

33. This subject is discussed in greater detail in the following chapter, pp. 229-231.

Difficulties with respect to product adaptation were mentioned by only two firms, each of which argued that its workforce had been trained to the high standards required for North Sea contracts and that therefore problems might arise when it was asked to lower its standards on contracts for less severe environments such as the Gulf of Mexico. A further four firms admitted that their product ranges were unsuitable for some export markets, even after a degree of product adaptation. Perhaps the clearest example was provided by one of the electronic equipment manufacturers :

"The main application for our systems is the North Sea. They were specifically designed for that sort of market and are not necessary for calmer waters. It's okay in a high-cost operation but the budgets are lower in the Gulf so they are not looking for expensive, high-technology items. If it's essential it's okay but a support item which can be added to a project is not viable."

Finally, the language barrier was mentioned by only a few firms, although more than one firm made comments such as "fortunately most of the people we deal with speak English".

Summary

Thus, the exporting problems most frequently mentioned by the sample were the additional costs and difficulties associated with export marketing; visible and invisible trade barriers; the inaccessibility of export markets; problems with respect to receiving payment; purchasing inertia and price uncompetitiveness. However, the importance of these various exporting problems did vary by product sector. For the shipbuilders, for example, the major problem was inability to meet international competition with respect to delivery and especially price, mainly as a result of low productivity and the subsidies provided to rival shipbuilding industries by overseas governments. On the other hand, two different factors limit the export potential of the platform builders and fabricators. Firstly, platforms and other fabrications are unsophisticated items which overseas governments are likely to insist are manufactured locally. Secondly, these items are heavy and bulky, and are therefore difficult and expensive to transport relative to their value. The major problems the process plant and wellhead manufacturers appeared to face were the additional costs and difficulties of export marketing

and, more especially, visible trade barriers (including both tariffs and domestic content regulations) imposed by countries developing their indigenous engineering industries. To the manufacturers of specialised oilfield equipment, problems such as tariff barriers and transportation costs were relatively unimportant and instead, in addition to overseas marketing difficulties, concern was expressed about the problems associated with payment and invisible trade barriers (problems considered to be less pressing by the shipbuilding, fabrication and process plant sectors). Finally, the electrical/electronic equipment manufacturers appear to have developed products with export potential, and therefore their main problems seemed to be those connected with marketing these products overseas (particularly supporting export markets), breaking down purchasing inertia and, for the small firms, coping with the limitations of their size.

There was, however, no evidence to suggest that management's attitude to exporting was influenced by its perception of either the range or severity of exporting problems, in that no association was found between managerial attitude to exporting and either the number or the nature of the exporting problems mentioned by the sample.

9.7 CONCLUSION

This chapter has presented an examination of the qualitative findings concerning the factors influencing managerial attitude to exporting and export performance. Apart from providing further details of the nature of the exporting activity being undertaken by the sample, section 9.2 outlined the export aims and policies of the surveyed firms, which were taken as being indicative of the attitude towards exporting adopted by the managements of these firms. Analysis then showed that there was an association between managerial attitude to exporting and export performance, in that a positive attitude to exporting appeared to be a necessary pre-requisite for successful exporting.

In sections 9.3 - 9.6 attention was focussed on certain factors which,

it was postulated, might influence the attitude towards exporting adopted by a firm's management. There was, however, no clear evidence that managerial attitude to exporting was strongly influenced by previous exporting experience. Nor did the relative profitability of export and domestic sales appear to be an influential factor - this finding being supported by subsequent evidence indicating that very few firms claimed to be exporting because exports were more profitable than domestic sales, while even fewer mentioned lower profitability of export sales as a problem.

As regards the influence exerted on management's attitude to exporting by its perception of future market trends, it is worthwhile reviewing the considerable volume of evidence concerning this relationship presented in this chapter. Firstly, in the course of the discussion of the exporting policies implemented by the sample³⁴ it became obvious - especially from some of the direct quotations included in the text - that in some firms management's perception of the effective level of demand for its products in both the export and domestic markets clearly did influence its policy towards exporting. Secondly, for over half the sample a major³⁵ motive for exporting was the desire to overcome the restrictions that the level of domestic demand placed on growth, indicating that in these firms management's perception of the level of domestic demand significantly influenced its attitude to exporting. Moreover, the only motive for exporting provided by eight exporters was the desire to take advantage of global opportunities, illustrating that in these firms attitude towards exporting was undeniably influenced by management's perception of the level of demand for its products in export markets. However, it was shown in section 9.3 that for the sample as a whole there was not a clear association between managerial attitude to exporting and either the current level of capacity utilisation or management's perception of the future trend in domestic demand. Thus, to summarise, in some firms managerial attitude to exporting was clearly influenced by management's perception of future market trends (and the resulting level of capacity utilisation) but overall there was not a close association

34. The export policies implemented by the sample were discussed in section 9.2 and analysed in section 9.3.

35. Although for those firms which provided more than one motive for exporting the desire to expand sales beyond the level possible in the domestic market may not even have been the most important reason for exporting.

between these two factors, perhaps because, as will be discussed below, this is just one of several groups of factors which will in general influence management's attitude to exporting. For example, although a firm's management expects the domestic market for its products to decline, it may nevertheless adopt a passive attitude to exporting because it believes that its products have no export potential or because it considers that it does not have the resources to enable it to export successfully.

It was postulated that a management's attitude towards exporting might be influenced by its perception of the range and severity of the problems associated with exporting. However, no evidence was found to suggest that management's perception of exporting problems was an influential factor. In contrast, there was evidence that in some firms management's attitude to exporting might be influenced by its perception of the benefits associated with exporting (and hence its reasons for exporting).³⁶ There was also some evidence of an association between the nature of the comparative advantages allegedly held by the surveyed firms and managerial attitude to exporting.³⁷

Thus, as shown in Figure 9.1, a firm's export performance was found to be closely associated with the attitude towards exporting adopted by its management. This attitude was itself influenced in some cases by managerial perception of future market trends, the benefits associated with exporting and the nature of the comparative advantages held.³⁸ However, none of these relationships was individually very strong, perhaps because there are, in fact, several groups of factors which influence managerial attitude to exporting.

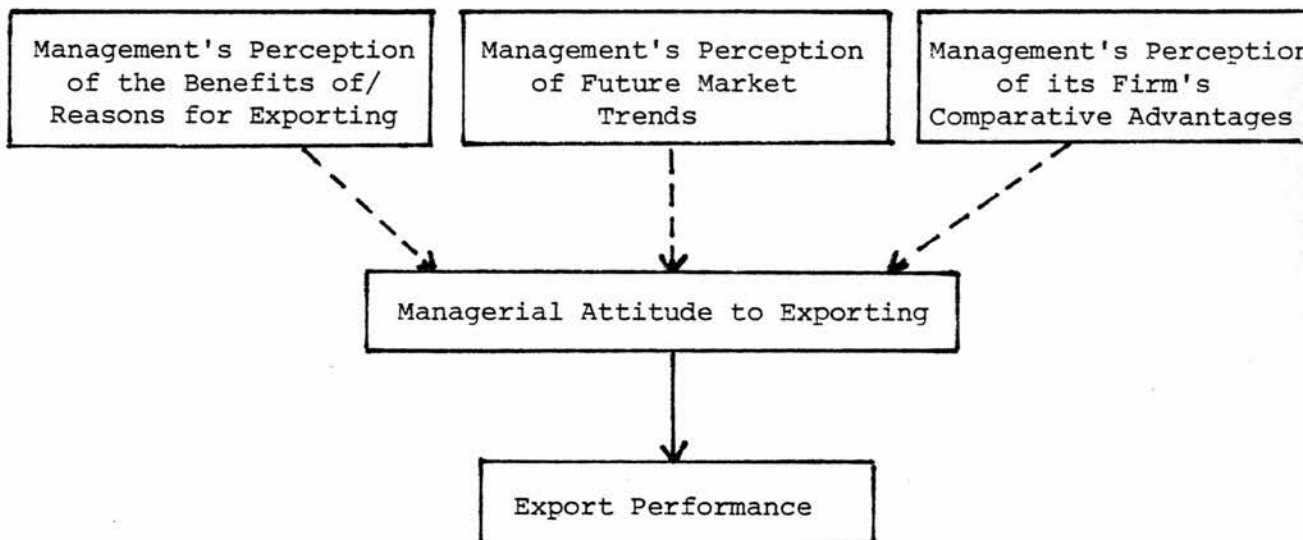
36. An association was also found between the nature of the reasons given for exporting and export performance, with those firms exporting for what might be described as 'aggressive' motives - such as the desire to take advantage of global opportunities - generally being more successful in export markets.

37. There was also an association between the number of alleged comparative advantages and export performance.

38. For this reason the relationships concerned are shown in Figure 9.1 (and subsequent figures) as broken lines.

FIGURE 9.1

The Relationship between Managerial Perception of Future Market Trends,
the Benefits of Exporting and the
Nature of Comparative Advantages Held and Export Performance

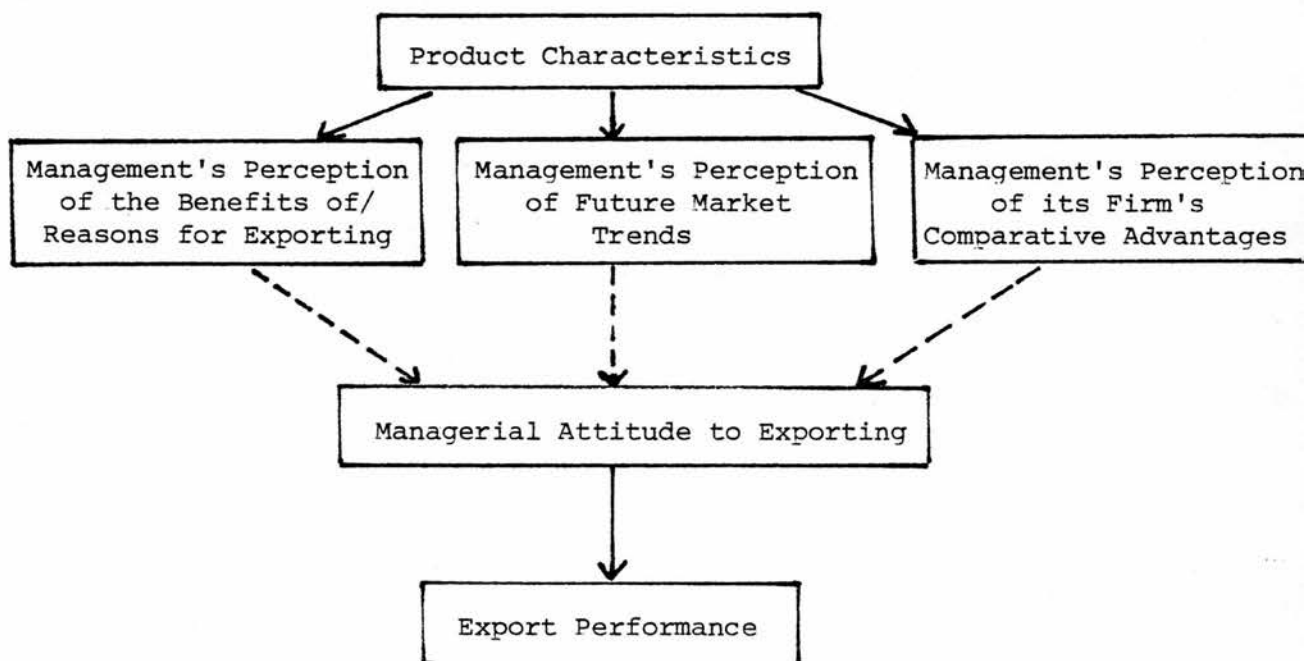


However, managerial perception of future market trends, the benefits of exporting and the comparative advantages allegedly held were, in turn, influenced by other factors, of which one of the most important appeared to be the nature of the product. In section 9.3 it was pointed out that the majority of the non-exporters which had adopted a passive attitude to exporting had done so because they had accepted that it would be extremely difficult to export their unsophisticated products, while the evidence presented in section 9.4 indicated that there were significant differences in the exporting motives of firms in different product sectors. Product characteristics also influenced the nature of the comparative advantages allegedly held. Indeed, the nature of the product influenced whether or not any comparative advantages were held - most of the firms to admit that they held no comparative advantages over their international competitors were from the fabrication sector. Finally the significance of the various exporting problems mentioned varied considerably by product sector. For example, while the fabricators were primarily concerned by the unsophisticated nature of their products and the cost and difficulties of their transportation, the oilfield equipment

manufacturers commented upon what were to the fabricators the less pressing problems of invisible barriers to trade and payment difficulties. Thus, to summarise, the nature of a firm's products significantly influenced its management's motives for exporting and also its perception of the problems associated with exporting, the comparative advantages it held and future trends in the demand for its products, and hence, in turn, influenced managerial attitude to exporting (as shown in Figure 9.2 below). This qualitative evidence suggesting that product characteristics influenced export performance (through their influence on the factors influencing managerial attitude to exporting) is consistent with the quantitative evidence presented in Chapter 8 and the discussion of the sample's exporting activities provided in section 9.2, which together showed that the nature of the product exerted a considerable influence over export performance and potential.

FIGURE 9.2

The Relationship between Product Characteristics and Export Performance



Analysis of the qualitative data also revealed that in some cases certain characteristics of the firm - namely offshore-related experience, nationality and size - influenced managerial attitude to exporting (and hence export performance). First, although many newly-established Scottish and U.K. firms argued that their experience in the North Sea had been sufficient to provide them with a 'track record', contacts or even a superior product which would give them an advantage over their international competitors, it was noticeable that all of the firms which had adopted a passive attitude to exporting were newly-established units with no offshore experience whatsoever prior to the development of North Sea oilfields. Second, 8 of the 9 'passive' firms were Scottish and not one a U.S. subsidiary. (This was consistent with the finding that U.S. subsidiaries tended to export for 'aggressive' motives). Finally, two-thirds of the firms which had displayed a passive attitude to exporting were small independent companies. (Again, this was consistent with the fact that while several large companies believed that their size was an advantage, more firms mentioned small size as a disadvantage than as an advantage).

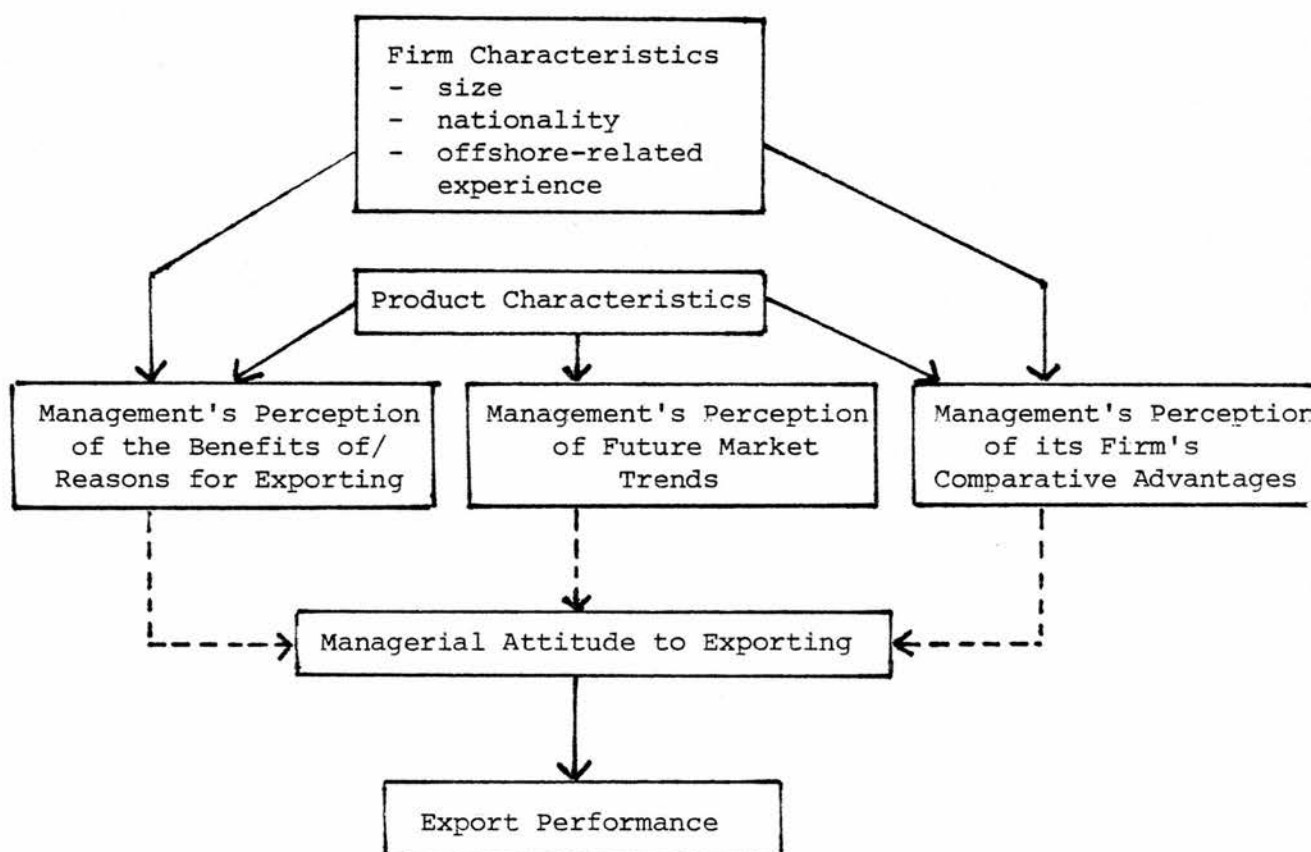
However, it should be noted that the results concerning the influence exerted upon managerial attitude to exporting by firm characteristics were inter-related in that all but one of the 'passive' firms were small or medium-sized Scottish firms, none of which had supplied equipment to offshore markets prior to North Sea oil developments. Similarly, it was noticeable that all but one of the firms to mention small size as an advantage and all but one of the firms to describe small size as a disadvantage were Scottish companies. This result can be partly attributed to the fact that Scottish firms tended to be smaller than the units established in Scotland by firms of other nationalities. However, the fact that the smaller U.K. and U.S. subsidiaries tended not to comment on the significance of their small size with respect to exporting might also suggest that for them it was the size of the larger group of which they were only part that was relevant as far as exporting was concerned. Thus, firm characteristics (such as size, nationality and the nature of offshore-related experience) influenced managerial perception of the benefits of (and reasons for) exporting and the comparative advantages

held over competitors³⁹ and, in this way, affected managerial attitude to exporting and hence export success. These qualitative findings concerning the influence exerted by firm characteristics are consistent with the quantitative evidence presented in the previous chapter which highlighted the significance of the relationship between offshore-related export performance and nationality, offshore-related experience and (to a lesser extent) size of firm.

The qualitative findings concerning the factors influencing managerial attitude to exporting (and the relationship between this attitude and export performance) are summarised in Figure 9.3 (below). It can be seen that product characteristics were found to influence management's perception of future market trends and that together firm and product characteristics had a bearing on management's perception of the benefits of exporting and the comparative advantages held over competitors. In turn, these three groups of factors were

FIGURE 9.3

Factors Influencing Managerial Attitude to Exporting and Export Performance



39. Size of firm also influenced managerial perception of exporting problems, but as there was no evidence that the latter exerted /

found, in many cases, to influence managerial attitude to exporting. The qualitative survey thus identified five major groups of factors affecting managerial attitude to exporting, which itself was found to be a vital determinant of exporting success.

/ a significant influence over managerial attitude to exporting (or export performance) this factor has been omitted from Figure 9.3.

C H A P T E R T E N

EXPORT MARKETING METHODS

10.1 INTRODUCTION

The previous chapter presented an analysis of the qualitative findings concerning the nature of the factors influencing managerial attitude to exporting. It was shown that the attitude towards exporting which the managements of the surveyed firms adopted seemed to be influenced by five main groups of factors :

- (1) product characteristics
- (2) firm characteristics
- (3) managerial perception of future market trends
- (4) managerial perception of the benefits associated
with exporting
- (5) managerial perception of the comparative advantages
held over competitors.

Managerial attitude to exporting was, in turn, found to be closely associated with export performance and, indeed, a positive attitude to exporting appeared to be a necessary pre-requisite for exporting success.

It was argued in Chapter 5 that the adoption of a positive attitude to exporting was essential if the resources necessary for the successful exploitation of overseas markets were to be committed to exporting. That is, the development of an effective export marketing programme was likely to suffer due to inadequate resources unless management implemented a sensible, positive policy with respect to exporting.

This chapter presents an analysis and discussion of the qualitative findings concerning the relationship between the export marketing programmes implemented by the 25 exporters of offshore-related equipment and their export performance. In the course of this discussion an attempt will be made to identify the part played in this relationship by managerial attitude to exporting and the commitment

of resources to exporting.¹

As the export marketing methods utilised (and hence the resource commitment required) will depend to a large extent upon the nature and number of the export markets exploited, this chapter commences with an examination of the export market selection policies implemented by the 25 exporters. This is followed (in section 10.3) by a discussion of the actual export marketing methods utilised, with individual sub-sections dealing with the topic areas of export pricing, product adaptation for export markets, export promotion, export distribution and export marketing research. Section 10.4 outlines the findings concerning the utilisation by the exporters of the range of export services provided by a number of organisations, including several government departments, banks, trade associations and chambers of commerce. It was argued in Chapter 5 that these services, particularly those provided by the BOTB, might be particularly useful for new exporters inexperienced in the business of supplying overseas markets and also for small firms which might not have the resources required to efficiently develop export markets. The way in which the surveyed exporters organised their exporting function is examined in section 10.5 before finally, in section 10.6, the results presented in this chapter are drawn together in the form of a conclusion, which highlights in particular the importance of the role played in exporting success by the commitment of resources.

10.2 EXPORT MARKET SELECTION POLICY

This section provides an analysis of the export market selection policies adopted by the 25 firms which had exported offshore-related equipment. It can be seen from Table 10.1 that while 7 firms had chosen not to limit in any way the number of markets to which they intended to export, 8 had decided to consciously select export markets for their offshore-related equipment and the remainder had had restrictions on the scope of their exporting activity imposed upon them.

Apart from one Scottish firm restricted under the terms of a licensing

1. The qualitative data examined in this chapter results from section C of the topics list (see Appendix 7.5) which was answered by the 25 exporters of offshore-related equipment.

agreement from exporting its diving systems outside European waters, the firms having export restrictions imposed upon them were the 9 U.S. subsidiaries, which were expected to limit the scope of their exporting activity in accordance with corporate strategy determined by their head offices in the U.S.A.

TABLE 10.1

Market Selection Policy by Nationality of Firm

Market Selection Policy	Nationality of Firm ²			Total
	Scottish	U.K.	U.S.	
No selection of export markets	3	4	0	7
Imposed restrictions on export markets	1	0	9	10
Conscious selection of export markets	5	3	0	8
TOTAL	9	7	9	25

SOURCE : Interview data

As shown in Table 10.2, where the Scottish subsidiary was the only manufacturing plant outside the U.S.A.³, it was normally allocated the Eastern Hemisphere (including Europe, Africa, the Middle and Far East and, sometimes, Australasia), leaving the U.S. plant(s) to serve North, South and Central America. Singapore appeared to be the favoured location for the second plant established outside the U.S.A. as this allowed the Eastern Hemisphere to be neatly subdivided, with the Singapore plant serving the Far East and Australasia (and sometimes also the Middle East) leaving the remainder of the Eastern Hemisphere

-
2. The joint-venture category has been omitted from this and subsequent tables since none of the joint-ventures had exported offshore-related equipment.
 3. The Scottish subsidiary was normally the first manufacturing plant of its type to be established outside the U.S.A.

for the Scottish subsidiary. Finally, if a further plant is required in the Eastern Hemisphere it is likely to be established either in Norway (due to the size of that market and the degree to which it is protected) or France (because of the advantage of having a 'French connection' in Abu Dhabi and several African markets). Indeed, one of the U.S. firms had already placed a manufacturing plant in France, while most of the others had strong sales offices or agencies in Paris.

TABLE 10.2

U.S. Subsidiaries' Export Territories

Firm	Location of other Manufacturing Plants	Territory Allocated to Scottish Subsidiary
C	USA (2); Singapore	Europe; North & West Africa
T	USA; Singapore; France; Argentina; Brazil	Europe; Middle East.
U	USA (2)	W. Europe; North & West Africa
V	USA (2); Singapore	E. Hemisphere (shared with Singapore).
W	USA	E. Hemisphere
Z	USA	E. Hemisphere
B2	USA; Singapore	Europe; Africa; Middle East
D2	USA (2)	E. Hemisphere
F2	USA	E. Hemisphere

SOURCE : Interview data

However, the rigidity with which these market allocations were imposed varied considerably. For example, in contrast to the very rigid market allocation policies imposed on four subsidiaries, the subsidiary with the least structured policy described it as follows :

"The Eastern Hemisphere/Western Hemisphere arrangement was rigid until the last 3-4 years but the ideal situation is to have all the factories full and if any plant is having problems we move business about. We'll take business anywhere and we'll quote anywhere. Very often 2-3 plants tender for the same order."

Although export market allocation in the remaining four subsidiaries was fairly rigid, some flexibility was allowed in order to spread the group's workload whenever a particular plant was experiencing difficulties.⁴ For example, one subsidiary which had been encountering considerable difficulty in winning orders explained that it had managed to prevent the Singapore subsidiary tendering for an order for India, despite the fact that its own price was considerably higher.

Within their allocated sales territories the U.S. subsidiaries had undertaken very little selection of export markets. For example, one of the oilfield equipment manufacturers explained that although the Scottish plant was the centre for all operations outside the American continent it was not necessary to select export markets:

"We have a very, very small customer base. We get a lot of big orders from very few customers so we do not shut anybody off or we could shut off 10% of our business."

Most of the firms which did consciously select export markets were large companies. These included two large process plant manufacturers (each of which ignored markets in which it felt it did not hold a comparative advantage of some kind) and the large power plant manufacturer which explained that "no one can cover the whole world completely".⁵ The larger, diversified fabricator carefully planned product launches in selected markets, concentrating effort upon the development of one market at any one time. For example, with respect to its tubular connectors this exporter exploited first the U.K. market and then the Norwegian market before turning its attention to the U.S.S.R. The market selection policy of the large electronics firm was clearly influenced by the fact that it considered itself to be relatively inexperienced in the offshore oil business :

"The first thing we must do is consolidate on our North Sea territory. Development must be steady, we must not throw our interests too wide so we can't perform adequately in any of these markets."

-
4. In these organisations tenders were co-ordinated by headquarters in order to prevent the group's various plants from entering into competition with each other.
 5. This exporter emphasised the importance of concentrating on North-west Europe where equipment can be sold to the large contractors in Italy, West Germany, France and Holland for use worldwide.

Similarly, a small fabricator explained :

"We've only been in this business a few years. We can only tackle so much effectively with given resources."

Thus, these responses indicate that in deciding to limit the scope of their exporting activities several of these firms took into consideration their previous experience and their resources. However, the fact that the group of firms which had decided to select export markets included four large firms and only two small firms would appear to conflict with the proposition that small firms are more likely to consciously restrict their exporting activities due to a shortage of resources. In fact, the qualitative evidence presented above indicates that even firms designated for the purposes of this study as 'large' did not have the resources to market their products world-wide, while in particular, the launch of new (offshore-related) products to a new (offshore) market on a global basis required a scale of investment beyond that feasible for any firm, small or large, newly established in the offshore supplies business.⁶

Similarly, it was noticeable that the firms which were not restricting their exporting activities included four small firms and only two large firms (although one of the small firms was part of a larger group). Once again, at first sight this would appear to be the opposite trend to that which might have been expected. However, it is obvious from the following statement by a small Scottish firm that in at least one case there had not been a conscious decision not to select export markets, but rather this strategy was more the result of the total absence of a formal exporting policy :

"I wouldn't know enough to select export markets,
I would sell to anybody."

-
6. The best illustration of the influence of resource availability on export market development concerned the planned establishment by a Scottish firm of a series of offshore support bases overseas :

"We're a small company, therefore we have to identify particular geographical areas. We survey them all and then boil them down to one or two, we don't have the management depth for more than that. Therefore it's a progressive planned path of development in certain markets. There is a temptation to go 'flag-planting', that is, to stick 'flags' in many areas without serious effort at successful organisation. It's a question of finite resources, we can't develop every market."

Thus, in addition to providing evidence that some firms took into consideration resource availability (and also the scale of investment required) in determining their export market selection policy, the qualitative findings also provided partial explanations for the absence of an obvious association between size of company and export market selection policy and, in particular, the lack of evidence suggesting that smaller firms were, in general, more likely to choose to consciously limit the scope of their export marketing activity in order to avoid spreading their resources too thinly.

It was also noticeable that the actual involvement in export marketing of the firms which stated that they did not restrict the scope of their export marketing activity varied considerably, from one firm which had only exported offshore-related equipment to Norway to another which had exported all over the world. Further analysis revealed, in fact, that the sample's stated policy with respect to the selection of export markets was not a good indication of the actual spread of its offshore-related exporting activity.⁷ For example, the majority of the firms which did not intend to restrict their exporting activities in any way were exporting to no more than 6 offshore-related markets, while another firm was exporting offshore-related equipment to around 30 markets within the Eastern Hemisphere, to which it was restricted.

As far as the actual scope of offshore-related exporting activity was concerned, there was evidence that small firms tended to export to a smaller number of markets than did larger firms. For example, not one of the small exporters was involved in more than a dozen export markets. This evidence was thus more consistent with expectations concerning the relationship between size and export activity than were the findings relating to the exporters stated export intentions. In addition, a strong association was found to exist between prior offshore-related experience and the scope of offshore-related exporting activity, in that none of the firms without any form of prior offshore-

7. See Appendix 10.1. The data concerning the actual scope of offshore-related exporting activity relates to only 22 exporters as it stems from Q.10 of the statistical questionnaire which was not answered by firms B, Y and K2 which had failed to export offshore-related equipment in the period for which data was collected.

related experience was exporting to more than a dozen offshore markets overseas. It should be noted that once again the important fact appeared to be that the group was established in the industry and the fact that the Scottish-based unit was itself new to the offshore business seemed relatively unimportant. Given these findings and the fact that the majority of the Scottish exporters surveyed were small firms without any form of previous offshore-related experience, it was not surprising to find that Scottish exporters tended to export to fewer offshore-related export markets than did the other exporters, with none exporting to more than a dozen offshore markets overseas. Thus, the scope of the exporting activity undertaken was found to be associated not only with the size of the firm, but also its offshore-related experience and nationality (although in practice these factors were inter-related).

It was suggested in Chapter 6 that firms which supplied a limited number of export markets might find exporting more profitable than firms which dispersed their marketing effort over a large number of markets. However, although the majority of the exporters which considered export sales to be more profitable than domestic sales were involved in a small number of export markets, overall no clear relationship was found to exist between the actual scope of offshore-related exporting activity and the perceived relative profitability of export and domestic sales. Nor was there any obvious association between the scope of export marketing activity and exporting success (measured in terms of the proportion of offshore-related turnover exported), as some of the firms most heavily involved in offshore-related exporting supplied equipment to a very small number of markets, while for other firms involved in a large number of offshore markets overseas exports represented a relatively small proportion of total offshore-related sales. However, a positive association was found between the volume of offshore-related exports and the number of export markets supplied, that is, most of the high volume offshore-related exporters marketed their equipment in a large number of offshore markets overseas.⁸

8. See Appendix 10.2.

Summary

The U.S. subsidiaries located in Scotland were all restricted (to varying degrees) in the scope of their export marketing activity by limitations imposed upon them by their head offices in the U.S.A. As these multinationals develop their global operations, establishing further manufacturing facilities outside the U.S.A., it appears that the territory allocated to the Scottish subsidiary will shrink (in geographical terms at least). On the other hand, the majority of these multinationals have in the past been willing to maintain some flexibility in their market allocation policies in order to ensure that any one plant will not suffer unduly as a result of a downturn in demand in its territory.

The export market selection policy implemented was found to be a poor indicator of the current scope of offshore-related exporting activity. When a second measure of the scope of exporting activity was adopted - the number of overseas markets to which offshore-related equipment was exported in the period for which data was collected - associations were found to exist between this variable and the size, offshore-related experience and nationality of the exporters surveyed. In particular, small exporters with no previous offshore-related experience (many of them Scottish) tended to be involved in fewer offshore-related export markets than were other exporters.

However, no evidence was found to suggest that the number of export markets supplied significantly influenced either offshore-related export performance or the perceived relative profitability of export and domestic sales.

10.3 EXPORT MARKETING METHODS

10.3.1 Export Pricing

When asked to compare export and domestic ex-works prices, many exporters argued that it was difficult to generalise since each contract was treated separately, with the price quoted depending very much on the circumstances of the particular contract and, among other things, the capacity loading in the plant. The following

explanation provides a good example of the complicated nature of the pricing process :

"The pricing philosophy is basically the same wherever it is. We build up the costs and add the mark-ups necessary. At the end of the day when in negotiations we take whatever actions are necessary to get the job, taking into account the loading of the factory and so on. We take everything into account."

Most of the exporters stressing the difficulty of comparing export and domestic prices concluded that they were roughly the same. Among the other exporters to state that ex-works prices for export and domestic orders were roughly comparable were those firms which argued that export markets were just as competitive as the domestic market, and also two exporters which pointed out that they used the same price list throughout the world, as one explained :

"We have one price list for everybody - they are the same customers anyway. As more and more of the big oil companies centralise their purchasing office we find we are dealing with the same people, the same department is handling the Middle East, Far East and so on. BP's central purchasing worldwide is done from Harlow. Shell have two - New York buys for North and South America and the Eastern Hemisphere is handled out of the Hague. Total buys everything from Paris."

It can be seen from Table 10.3 that 20% of the exporters sold their products in export markets at prices above those which pertained to the domestic market. Some exporters explained that this was because competition was less severe overseas, but others argued that higher prices were necessary to cover the additional costs and risks involved in exporting. Finally, only one exporter sold its products overseas at prices below those in the domestic market (as a result of a deliberate policy to make its exports more competitive in order to increase sales volume).

Thus, most exporters estimated that export and domestic prices were roughly equivalent. In most cases this was apparently due to the competitive nature of export markets (with several exporters commenting that they were operating in a world market in which it was very difficult to isolate segments in which there was less competition) and in only two cases was uniform pricing the result of the use of standard price lists applicable throughout the world. Table 10.3

TABLE 10.3

The Association between the Relative Pricing and Relative
Profitability of Export and Domestic Sales

Relative Pricing in Export & Domestic Markets	Relative Profitability of Export & Domestic Sales			Total
	Exporting more profitable	Export & domestic sales equally profitable	Exporting less profitable	
Export prices higher	3	1	1	5
Export & domestic prices roughly equivalent	3	12	4	19
Export prices lower	0	0	1	1
TOTAL	6	13	6	25

SOURCE : Interview data

indicates that apart from the single exporter which had purposely reduced its profit margin, five other exporters which charged similar or even higher prices in export markets nevertheless found export marketing to be less profitable (due to the additional costs of exporting). It was therefore interesting that three exporters which were charging similar prices in export and domestic markets argued that exporting was more profitable. This apparently inconsistent result might conceivably be explained in terms of different costing methods applied to export and domestic orders, but unfortunately no data concerning this aspect was collected during the course of the survey. Finally, as might be expected, the majority of the exporters which had set export prices above those for domestic orders had found exporting more profitable.⁹

10.3.2 Product Adaptation Policy¹⁰

Although they undertake continual product development in response to

9. There was no obvious association between the relative pricing policy adopted and firm size, nationality, experience, offshore-related export performance, offshore-related export sales volume or product characteristics.

10. The nature of the products exported by the sample has already been discussed in section 9.2 above.

problems created by new environments, the oilfield equipment manufacturers agreed that basically they produced standard products for sale worldwide, with a typical comment being :

"The tools that are exported are no different to the ones sold for use in the North Sea, they are still to API standards."

On the other hand, although the basic design of their equipment is standard, for the wellhead manufacturers each major offshore contract will be different in some way from the last, requiring the development of an individual wellhead system. The significance of the modification sometimes required was highlighted by one firm's comment that it turned down orders that it couldn't handle technically.

The exporters in the process plant sector all undertake product adaptation for export markets. For example, pumps for high pressure fields require to be manufactured from a higher grade of steel while there will be trim variations on valves used offshore depending upon several factors such as the service it is to fulfil, the nature of the fluid which will pass through it and its location.

In the fabrication sector, although diving systems will be adapted according to the depth of water in which they are to be used, environmental conditions are not a factor influencing the need to modify accommodation modules and other containerised units, the internal design of these items being determined solely by the customer's particular requirements. Similarly, although the rig-builder produces drilling rigs to a standard design, "the client has the chance to jockey all the equipment around, it's all subject to negotiation." Also, every support vessel built by shipbuilder B will be a 'one-off' constructed either to the customer's specification or to the yard's own design given the function the vessel is to perform for the client.

In the power plant sector there was some disagreement. While the motor control centre manufacturer argued that very little modification was required for overseas markets, the motor/generator manufacturer stressed that it was very important to modify equipment :

"We can't sell something that Shell wants to Aramco if it doesn't meet his specifications. You've got to give him what he wants. He writes his own specification. Most specifications we receive are very, very detailed."

It is impossible to discuss the importance of product modification without referring to particular products, and as the survey covered a relatively small number of firms in several different product sectors it is extremely difficult to reach conclusions which hold for the sample as a whole. In particular, no evidence was found to suggest that firms manufacturing the same or similar products adopted different policies with respect to product modification depending upon their attitudes to exporting.¹¹ However, it is clear from this discussion that most items of offshore-related equipment exported by the sample (with the exception of certain items of oilfield equipment, such as the more basic down-hole tools) are either 'one-offs' or products which will require a degree of modification in order to meet the needs of overseas customers. As one electronic equipment manufacturer remarked :

"The product must be tailored to the market. We must remember that the products have been developed for the North Sea."

Thus, although only two firms mentioned product adaptation as a problem affecting exports,¹² the fact that for most firms exporting will require product adaptation and development means that entry into export markets will not be costless.

10.3.3 Export Promotion

It can be seen from Table 10.4 (below) that 22 of the exporters had undertaken personal selling, making this the most popular method of promoting exports.

11. As was suggested in Chapter 6 might be the case.

12. While a further 4 firms stated that their product ranges were not suitable for all export markets - see p.199 in Chapter 9.

TABLE 10.4
Methods of Export Promotion

Method	Number of Exporters Utilising this method of Promotion ¹³
Personal Selling	22
Advertising	19
Sales Promotion, of which	18
- exhibitions & trade missions	(14)
- sales literature	(7)
- direct mail shots	(1)
- other	(2)
Publicity	2

SOURCE : Interview data

One reason for the popularity of personal selling was the nature of the offshore supplies market and, in particular, the small number of customers which exist for most offshore-related products - as one fabricator pointed out ... "it's not like selling brushes". Where the global offshore market does consist of a small number of very important customers an export sales team can cover the entire market, as a second fabricator explained :

"It's not like going into a market and having to develop trading links and contacts, it's not like selling biscuits into Indonesia. Our network of contacts is already established, it's basically U.S., Houston-based. We need to develop a relatively small but very aggressive team of people - sales people, engineers and designers - who are prepared to be very, very mobile."

Moreover, the drilling rig manufacturer's customers were so geographically concentrated that its sales network consisted of a single office (in Houston) :

13. Some firms provided multiple responses.

"It's a close knit community within which we do business - 90% of the drilling contractors are in the U.S.A. and 85% of them are based in Houston so selling is concentrated there. There's no need for us to get bogged down in a whole fleet of salesmen."

Indeed, several exporters commented on the fact that the offshore oil business was like a 'club' based in Houston, membership of which was essential. Typical of the explanations provided was the following :

"Everybody knows everybody else. In the oil business it's the old pals act again and again which is important. The last order I got in the U.S.A. was from a man I'd worked with in Flushing 12 years ago. I hadn't heard from him since but he called me up and asked me out to lunch and over lunch we set up a deal."

The fact that the exporters often found themselves involved in negotiating high-value contracts with a multi-individual customer also influenced the choice of promotional methods, as is clear from the following remark :

"We believe in direct selling. The orders we get are £½-1 million each, where it is possible to identify 3 or 4 people to get to per order. Therefore by and large we work with technical sales experts."

For example, one wellhead manufacturer stressed the ability of salesmen to identify and reach both the senior officials apparently responsible for the purchasing decision and also those people that used the product and were therefore likely to influence the final purchasing decision. The flexibility of salesmen was perhaps even more important to the motor/generator manufacturer which pointed out that in most cases it was selling to a multi-client customer, including not only the end user but also an engineering contractor, architect/consultant and the original equipment manufacturer, that is, the manufacturer of the pumps or compressors to be driven by its motors. The mobility of the sales effort provided by the salesmen was also stressed by several exporters, with the following remark being a good example of the explanations provided :

"The sales guys should be like Bertram Mills circus - living in a tent. If the market goes into decline they take the tent elsewhere, as the market changes we have to change with it."

Finally, apart from giving sales presentations to customers while overseas, salesmen can also perform other tasks, such as checking on the performance of agents and gathering valuable marketing intelligence, as one marketing manager explained :

"I go overseas and knock on doors. You discover problems with agents once you get out there - their letter-writing might be good but they may be sitting on their backsides. Also I find out from the customer what their forward plans are over the next 6 - 12 months."

Only two exporters mentioned that they used publicity in the press or on radio or television as a non-personal means of stimulating demand for their products in export markets, despite the fact that publicity is in fact 'free advertising' not paid for by the sponsor. Moreover, while one of these firms was quite happy providing its overseas agents with material for press releases, the other explained that it was reconsidering this practice :

"We've used press releases but I don't like them. It lets your competitors know with whom you're doing business, that is, who has business to offer."

A variety of forms of sales promotion were used by the exporters to stimulate demand for their products overseas, including exhibitions, trade missions, direct mail shots, sales literature (such as brochures and catalogues) and seminars. There was some disagreement concerning the benefits which could be expected to be derived from participation in exhibitions and trade missions overseas. For example, one of the smaller, less well-established electrical/electronic equipment manufacturers sought a number of benefits from exhibiting overseas :

"It's a good way of finding agents. Also it's a good way of backing up agents. They can't stock everything, we're very diversified for such a small company. We take along what he wants and he brings along the clients and with a bit of luck we sell it, that's why we always take working equipment over to exhibitions. Also you meet the people you want to speak to, it's a good way of short-circuiting the information channels."

On the other hand, one established electrical equipment exporter participated in exhibitions only on an irregular basis and for a very specific purpose :

"We have used them in the past, to get into a new market essentially. The North Sea is a good example of this, we exhibited in Houston for 5 years around the time the North Sea was developing."

Several firms took part occasionally in non-offshore specific British trade missions and exhibitions overseas, although only when these were considered 'special'. Among the trade missions regarded as special were those to Japan, China and Eastern Europe (including Poland, East Germany and the U.S.S.R.). While only two exporters mentioned as a promotional tool the provision of seminars and only one referred to its use of mail shots directed at prospective customer organisations to provide leads for its salesmen, several exporters did mention their use of sales literature (including catalogues and brochures), with the following being typical of the remarks emphasising the importance of appropriate, technical, sales literature :

"To sell our products, it's no good telling everybody how wonderful we are, they need to know what we've done, so a reference list is very important - plus the normal technical literature."

Although most of the exporters undertook advertising, this was, however, entirely restricted to the trade press. Moreover, although a few exporters (in the process plant and electrical equipment sectors) advertised in technical journals not specifically directed at the offshore market,¹⁴ most of the advertisers concentrated on a number of offshore-related (or at least oil-related) publications which are internationally read, as one large U.S. multinational explained :

"We advertise in oil journals which go worldwide but there's no specialised advertising in export markets. We do quite a lot of first class advertising, in most of the magazines we have a full page or two."

In the case of the U.S. subsidiaries, policy with respect to the advertising undertaken in the international oil magazines (and also the international oil exhibitions and promotional materials such as films) was generally determined by their head offices in the U.S.A., with the Scottish subsidiaries merely being left to organise the local marketing effort, including the offshore exhibition held in Aberdeen.

Even among those exporters which did advertise, opinions as to the

14. Although this advertising primarily stressed these firms' general spheres of competence, their offshore capability was also mentioned.

usefulness of advertising varied considerably. For example, although concerned about its cost, one newly-established U.K. firm considered it to be essential to advertise in oil journals such as Ocean Industry ...

"which is recognised and is in most offices throughout the oil world. We take 6 months in every year which is quite expensive but the response from it is excellent."

On the other hand, a few advertisers admitted that their advertising budgets were limited, primarily because they felt that they were already well-known and that therefore advertising was less essential, a typical comment being the following :

"Advertising tends to be a public relations exercise, we are already well-known from Alaska to New Zealand in the things we do. It is just taking a corporate message occasionally to people we already know."

Indeed, two of the non-advertising exporters argued that as they were established in the offshore oil business there was no need to advertise overseas as they could depend upon 'word-of-mouth' advertising to work on their behalf.

Summary

Thus, despite the fact that several firms described the cost of overseas selling as a problem influencing export performance,¹⁵ most exporters regarded personal selling as the first essential as regards the promotion of exports. This fact was evident not only from the data contained in Table 10.4 (above), but also from comments such as "advertising is all very well but you need personal contact as early as possible" and "we spend a lot on travel and sales visits, this is better value than money spent on advertising". A key factor influencing this emphasis on personal selling appeared to be the small number of customers which existed in most sectors of the offshore market, although the preference for personal selling also appeared to be influenced by the geographical concentration and multi-individual nature of customer organisations and the high-value nature of offshore contracts.

15. See p. 198.

However, it is also clear from the discussion of the methods of export promotion utilised by the exporters that the various promotional tools were to a certain extent seen as performing different functions, with advertising being used to create and maintain an awareness of the exporter, its capability and its reputation in customer organisations, while the main sales effort was through personal selling. It is therefore not surprising that most exporters used more than one method of export promotion. Indeed, 15 exporters utilised personal selling, advertising and some form of sales promotion simultaneously.

As all but 2 of the 25 exporters had adopted a positive attitude to exporting it was impossible to reach a general conclusion as regards any possible relationship between managerial attitude to exporting and the commitment undertaken in promoting offshore-related products in export markets. Nevertheless, it was interesting that neither of the firms which had adopted a passive attitude to exporting had undertaken any form of export promotion whatsoever.

Evidence was found, however, of a clear, positive association between the number of methods of export promotion utilised and export performance.¹⁶ In particular, none of the exporters which had failed to undertake any form of promotional activity aimed at offshore markets overseas had exported more than 10% of their offshore-related turnover, while none of those exporters employing two or less methods of export promotion exported more than 30% of their offshore-related turnover. Thus those exporters which employed a wide range of methods of export promotion tended to export a higher proportion of their offshore-related turnover.

At first sight there did not appear to be a close association between size of firm and the extent of promotional activity undertaken, in that half of the small exporters had utilised three or four methods of promotion. However, most of these units were part of larger groups and in fact four of the five small independent exporters utilised no more than two methods of promoting exports. This suggests that in these four small firms export promotion was restricted by a shortage of resources. This lack of resources resulted in three of these firms being unable to undertake personal selling overseas (despite its recognised importance as an export sales promotional tool), while the entire personal selling activity undertaken by the fourth

16. See Appendix 10.3.

consisted of two unrewarding sales trips to India by its managing director, who explicitly mentioned that although he would like to employ salesmen he just could not afford them. In addition, it was noticeable that the fifth small, independent Scottish exporter, which did possess a small international sales team, commented :

"We're a bit thin on the sales side but we're having to make do until we've got more finance. We'll probably use marketing agents overseas."

Thus, strong evidence was found that in some small firms export promotion was restricted by a lack of resources, (this result being consistent with the previous finding that several firms regarded their small size as a disadvantage in export markets).¹⁷

In addition, in general there was an association between the number of methods of export promotion utilised and the nationality and previous offshore-related experience of the exporters. In particular, the U.S. subsidiaries tended to utilise more methods of export promotion than the other exporters (especially the native Scottish firms). The U.S. subsidiaries were also amongst those firms with previous offshore-related experience (at the group level if not at the level of the Scottish subsidiary itself) which were found in general to use a greater number of methods of export promotion than firms without any form of prior offshore-related experience.¹⁸ The extent of the inter-relationship between these firm characteristics is highlighted by the fact that small, Scottish firms with no form of prior offshore-related experience accounted for four of the six exporters which did not advertise their offshore-related products and for all three of the exporters which did not undertake personal selling.

10.3.4 Export Distribution

It was shown in the previous section (10.3.3) that 21 of the 25 exporters were selling their equipment direct to export customers on a regular basis. Of these, eight exporters depended upon export salesmen which were based in the U.K., a further eight had established permanent offices overseas in addition to their export sales teams based in the U.K. and five exporters had overseas bases but were without U.K.-based export sales teams. Thus, as shown in Table 10.5 (below), 16 exporters

17. See p. 197-198.

18. See Appendix 10.4.

regularly sent salesmen and other company employees on overseas sales trips, while 13 had established permanent bases overseas.

TABLE 10.5
Methods of Export Distribution

Methods of Distribution	Number of Exporters Utilising this Method of Distribution
Agents	18
Overseas sales trips by salesmen and other company employees	16
Overseas sales subsidiaries	13
Associated companies	4
U.K. supply companies	3

SOURCE : Interview data

The location of these permanent bases overseas reflected the pattern of purchasing authority for offshore-related equipment, which is, as has already been pointed out,¹⁹ centred on Houston. For example, one power plant manufacturer explained that it had ...

"a strong operation in the States partly because of the volume of domestic business there is, but in addition because of the considerable amount of business dictated and influenced by U.S. companies not for use in the States - much of the equipment for the oil and petro-chemical industry worldwide is handled out of Houston."

Similarly, the second most important location for a sales office appeared to be London (where several oil companies have established purchasing offices), while other favoured sales office locations were Paris (important for the French-speaking African markets) and the other major cities of Europe (where direct selling activity was aimed at the head offices of large contractors operating worldwide). However, the pattern of purchasing authority will, of course, depend

19. See p. 222.

upon the nature of the product. Generally speaking, purchasing authority was found to be particularly concentrated in the case of the major expensive items of equipment such as drilling rigs and power plant, with purchasing decisions regarding smaller, less expensive and more frequently purchased items such as down-hole tools being made at a lower level in a number of locations. In this respect it was noticeable that two U.S. exporters of oilfield equipment (for whom down-hole tools represent a major product line) had established sales networks which in the Eastern Hemisphere alone consisted of 52 and 31 overseas offices respectively. For example, the latter firm had divided the Eastern Hemisphere into 31 'districts' "which are located in every major offshore location in the world, where all the selling is done out of the district".

However, these overseas subsidiaries were set up not only as sales outlets but also as service bases, that is, they were established in order to be able to fulfil the oil industry's demanding requirements with respect to quick and efficient maintenance. It has already been pointed out that the support of export markets was regarded as a major exporting problem by a significant number of firms, which argued that it was too expensive and too time-consuming to send U.K.-based personnel overseas to undertake repair and maintenance.²⁰ The only solution to this problem was generally seen as being the provision of service facilities overseas, either by establishing wholly-owned service bases or by appointing agents to undertake the service function.

Indeed, the ability of agents to provide a local maintenance service was a major reason for their employment by the majority of the exporters.²¹ For example, the pump manufacturer emphasised :

"the need for some indigenous type of organisation to really get off the ground for exporting. It's difficult to make a direct sale from here of equipment produced from here. We have 70-80 agencies which have service facilities which we use, established companies serving similar industries but not pumps."

A second important reason for the use of agents was the legal requirement which exists in many countries (including Brazil, Mexico and the Middle

20. See p. 198.

21. Altogether 18 of the 25 exporters employed overseas agents (see Table 10.5).

East) that a local agent, usually a national of that country, be appointed. Thirdly, agents can, of course, carry out a number of selling and other activities on behalf of the exporter.

On the other hand, some of the manufacturer/agency relationships were found to be extremely complex and, as has already been pointed out,²² involved the exporter in a number of problems, particularly when the precise details of the arrangement were not contained in a tight agency contract. The great majority of the agency relationships were, however, based on detailed, formal contracts, most of which specifically prohibited the distribution and sale of competitive products. Nevertheless, several exporters mentioned that the very fact that agents handled other companies' products at all created problems, as one observed :

"Agents are not committed to your particular company, they peddle a lot of companies' equipment, which is not the best situation. You lose a lot of time on a contract if the agent is not doing his job properly."

Only one exporter actually sold its (electronic) equipment to its agents and only one further exporter used its agents as stockists of its oilfield equipment. Thus, as far as selling activity was concerned, in the vast majority of cases agents were employed simply to support sales effort in the local market and forward enquiries to the manufacturers. These firms in turn tendered for the contract and, if successful, supplied the equipment direct from their Scottish plants. However, the exact relationship between a manufacturer and its agent during negotiations was often very much more complicated than this simplified picture, with the exact manner in which salesmen and agents combined to provide an effective sales effort during negotiations varying by exporter, by agency (and, in particular, its precise area of competence), and by contract, with, for example, the manufacturer's own salesmen tending to play a greater part in the case of large or technically complex contracts and generally becoming more involved as negotiations moved towards the later, critical stages. Generally, however, agents were used primarily ...

"for making contacts, not selling. They know the language, the customs, how to get to the people in the government and so on."

22. See p. 198.

Several exporters distributed sales literature through their overseas agents, partly in order to keep them interested. However, the most common form of support given to overseas agents was a visit by company employees. One experienced exporter summed up the situation concerning the support, motivation and management of agents as follows :

"At the end of the day agents are only as good as you can make them. You must service them and respond to them, they'll do nothing if you let them. Agents come in 3 varieties : the unexcited variety where you can kick their backsides and still get no effort; the separately excited variety where you can kick their backsides every 6 months and get effort; and the self-excited variety where you have to hold them back - there's not too many of them though."

Nevertheless the major factor motivating an agent is, of course, the commission received on sales,²³ and it was for this reason that one of the process plant manufacturers argued that major items of capital equipment were best sold direct rather than through agents :

"Agents are motivated by getting a regular percentage frequently on regular sales. Direct selling is the only way to sell because we are in capital goods which come infrequently in large lumps."

Of the four small firms which had not undertaken personal selling in export markets on a regular basis, one had chosen to export through overseas agents which carried out all selling and maintenance activities. The remaining three firms were exporting through Aberdeen subsidiaries of multinational offshore supply companies, an arrangement which apparently offered these small firms two main advantages. Firstly, these supply companies possessed established relationships with the major offshore customers worldwide, which the manufacturers could only develop themselves at some expense over a considerable period of time. Second, these multinationals had exporting experience and could undertake all the necessary export-related activities (which require expertise and would have involved the manufacturers in substantial investment). Hence, to these firms exporting was, as one remarked, "just like domestic business". Thus, these four small firms, which did not have the resources to undertake

23. Together with the selection of agents in new markets, the calculation of the commission due to agents was an area which, in the absence of a precise contract, was found to create problems for exporters.

effective direct selling, had chosen to export through middlemen.

Finally, a few British exporters were utilising the overseas sales and service networks of their parent organisations, where appropriate. For example, one exporter explained that its parent had ...

"a lot of footholds, extremely large footholds in some areas. For example, they are doing a lot of negotiating in China so we are doing our selling in China through them."

Summary

Thus, although very much dependent upon the nature of the product, purchasing authority for offshore-related equipment tended to be heavily concentrated in Houston and, to a lesser extent, in London and other major European cities. Despite this, many offshore-related manufacturers considered it essential to have a comprehensive network of local representatives (be they agents or wholly-owned sales and service outlets) in order to be able to fulfil the oil industry's demanding requirements with respect to quick and efficient maintenance and also the local government's regulations as regards 'domestic content'.

Overall, the U.S. subsidiaries tended to establish their own sales and service bases overseas (supplemented where necessary by the appointment of agents) whereas those British companies which had developed global sales and service networks tended to rely more heavily on agents. For example, the 13 exporters which did have their own sales and service outlets overseas consisted of 7 out of 9 U.S. subsidiaries but only 6 out of 16 British exporters of offshore-related equipment. Moreover, it was noticeable that three sizeable British companies (in different product sectors) which claimed to have established agencies in virtually every country in the world had not yet taken the step of establishing a single sales office overseas (and, incredibly, one of these exporters employed only one salesman for the entire export market).²⁴ In these cases it appeared that an unwillingness to risk resources in export markets may have influenced the determination of the sales and distribution network.

24. This suggests an unequal distribution of sales effort between the domestic and export markets, a question which will be discussed in greater detail below.

However, undoubtedly part of the explanation for this difference in distribution methods apparently related to company nationality lies in the fact that the U.S. subsidiaries in Scotland to a considerable extent inherited an existing sales network originally established to sell and service equipment manufactured in the U.S.A., whereas several of the British exporters were completely new, independent firms without any prior offshore-related experience. That is, the establishment of an appropriately located network of sales and service bases was something which only those firms which had been involved in the offshore business for a substantial period of time could be expected to achieve. This is evident from the fact that the 13 exporters with overseas sales and service bases consisted of six established firms, six new units with prior experience at group level (that is, 6 subsidiaries of established companies) and one small, new firm which had started to develop its own sales offices overseas only with considerable financial backing from its parent company.

It should also be re-emphasised that the U.S. subsidiaries were, of course, part of large organisations which had the resources to establish overseas sales and service bases, which was not the case with all the British exporters (particularly the Scottish firms), several of which were small companies which couldn't even afford to employ an export salesman,²⁵ never mind set up an overseas sales subsidiary. For example, one firm had undertaken a detailed costing exercise :

"We sent a man on a 90-day tour of the Middle East and he found that to keep a man and his secretary in Abu Dhabi would cost £100,000 a year. We are a very cautious lot, there's no way we'd put up that much front money. The firm is very conservative, outlook very narrow."

Thus, firm size and length of experience were found to significantly influence the methods of export distribution utilised by the sample. There was evidence that small firms begin to export through organisations in the domestic market which relieve them of most of the problems associated with exporting. Thereafter, these firms may attempt to develop their own links with overseas markets, perhaps firstly by exporting through overseas agents and then by employing

25. See pp. 226-227.

export sales representatives to sell direct to the customer. In time, when the company has increased in both size and exporting experience, it may establish its own sales subsidiaries overseas. The U.S. subsidiaries located in Scotland did, of course, have the advantage of being part of large organisations well-established in the offshore oil supplies business. However, there was evidence that the difference in the export distribution methods utilised by exporters of different nationality could not simply be explained in terms of these two variables. In particular, certain large established British exporters were found to rely entirely on agents in overseas markets, having failed to commit the resources necessary to establish even one permanent office overseas.²⁶

This observed difference in behaviour as regards the methods of export distribution utilised by firms of different nationality is not favourable from the point of view of British exporters in that a clear association was found between exporting success and the use of export distribution methods involving direct contact with, and the investment of resources in, export markets.²⁷ For example, none of the firms selling indirectly to export customers exported more than one-third of their offshore-related turnover, while all but one of the exporters which had achieved this level of exporting success possessed sales and service subsidiaries overseas.

10.3.5 Export Marketing Research

It has already been pointed out that only a few firms mentioned the collection and analysis of export marketing research data as a problem area.²⁸ Moreover, while one U.S. subsidiary argued that it was not too difficult to keep up-to-date with the global offshore situation because "the oil world is a very small place", another exporter (entirely dependent upon its salesmen for export marketing intelligence) commented :

"If we cover the major oil companies that's about all we need to know. All the oil companies tell us their plans worldwide."

26. Nor had either of the exporters which had adopted a passive attitude to exporting committed resources to exporting, having both decided to export through middlemen.

27. See Appendix 10.5. A similar association was found between methods of export distribution and volume of offshore-related exports.

28. See p. 198.

Thus, it appeared that in general the collection of export marketing intelligence did not represent as big a problem for the sample as it does for manufacturers in other industries, due to the concentration of purchasing authority (for most offshore-related products) in a small number of customer organisations in certain key locations (such as Houston).²⁹

The sources of export marketing intelligence utilised by the exporters of offshore-related equipment surveyed were classified into three categories: the trade press; external sources (including the OSO, BOTB, trade associations and banks); and the exporters' own internal information systems (based on information reported by salesmen, agents and other personal contacts).

The exporters which mentioned that export marketing intelligence gleaned from the trade press represented a major information input were very much in the minority,³⁰ despite the fact that these firms claimed that the publications concerned - the major international oil journals - provided a good deal of useful information. Moreover, none of the firms which exported more than one-third of their offshore-related turnover mentioned the trade press as a good source of intelligence concerning offshore-related markets overseas, that is, published information was heavily utilised only by less successful exporters.

The majority of the exporters received export marketing intelligence from at least one external organisation, of which the most heavily utilised was the OSO. Roughly half the exporters which used the OSO had no complaints about the information service it provided. However, some firms alleged that the information supplied by the OSO was usually out of date, as one U.S. subsidiary explained :

"Their latest and greatest we knew a year ago. You see what the OSO fails to realise is that to have a chance to supply you need to be in at the start, at the specification stage, well before the tender stage. The client asks a group of

29. In-depth marketing research - for example, identifying the key personnel within a customer organisation with respect to a certain purchasing decision - is, of course, nevertheless a difficult exercise.

30. See Table 10.6.

engineers to draw up plans of the project and they pick a group of manufacturers whose products they like and their products go on the specification sheet. It's very difficult for anybody not on that specification sheet to get the order. So when the OSO say 'it's now coming out for tender' it's too late. What we need to know is 'it looks like the following project is going ahead'."

TABLE 10.6

Sources of Export Marketing Intelligence Utilised

Sources of Intelligence Utilised	Number of ³¹ Exporters
Internal information system	19
External sources, of which	15
- OSO	(11)
- BOTB	(7)
- Trade associations	(3)
- Banks	(1)
Trade press	6
None	2

SOURCE : Interview data

Criticism was also levelled at the competency of OSO personnel and the standard of the work they produced. On the other hand, one exporter which did use the OSO argued that some of the blame should be shared by the offshore suppliers themselves for their failure to use the service provided by the OSO properly :

"You must use the OSO properly - 70% of the offshore suppliers have the attitude 'where can we sell it'. I think we use them properly. When we hear about something we hit them and we want an answer, and if you know the people you can get the answer."

Similarly, a second exporter remarked :

"We find them very useful. Companies want the OSO to put it to them on a plate. They are told about market opportunities identified by the OSO but they won't take the risks. They want the OSO to act as their marketing operation, but they can't do that."

Although the second major external source of export marketing intelligence, the BOTB's Export Intelligence Service (EIS) received heavy criticism from both users and non-users, particularly the U.S. subsidiaries

31. Some exporters provided multiple responses.

(none of which utilised the EIS). U.S. subsidiaries in the wellhead and oilfield equipment sector argued that the EIS was not sufficiently specialised, with the result that the information it provided was unsuitable and therefore useless. Typical of the responses provided was the following :

"The BOTB is not much use for oilfield equipment. Export information is tailor-made for consumer goods like washing-machines."

The other serious criticism levelled at the EIS by several of its users (and also some non-users) was that the information provided was usually out-of-date, as illustrated by the following quote :

"By the time you read there's a project in Peru the chances are the job has been on the go for a couple of years. You usually have to prequalify and get on the list of accepted suppliers and by then it's too late to do so. We have to go on the job right at the time they're thinking about it. The effort to get the enquiry should be equal to the effort going into the tender, you've got to get in to have a chance."

Only a small number of exporters mentioned banks and trade associations as a major source of export marketing intelligence,³² although these firms appeared to value the information these organisations provided. However, one firm did explain that although it received the weekly international brief from the British Marine Equipment Council (BMEC) it was not used because ...

"by the time the information is in there the decisions and specifications will all have been made."

Thus, all the external sources of information were criticised to some extent, primarily for not supplying information at an early enough stage of an overseas contract. The EIS was, however, also heavily criticised for its failure to provide sufficiently detailed information for this specialised area of industry. The fact that more exporters used the OSO as an external source of export marketing intelligence than the EIS was surprising given that the OSO has devoted only a small share of its resources to the identification of overseas opportunities and that, as a result, it has only attempted to provide information concerning major offshore developments overseas (leaving the EIS to handle the flow of information concerning smaller

32. See Table 10.6 above.

contracts). However, the OSO and EIS were both used as a source of export marketing intelligence by those firms less successful in export markets. Indeed, none of the exporters utilising the EIS and only one of those using the OSO exported more than one-third of its offshore-related turnover in the year for which data was collected.

As might be expected, the external sources of information were most heavily criticised by those exporters (especially the U.S. subsidiaries) which had their own extensive internal information systems. Apart from being the intelligence source most utilised by the exporters surveyed,³³ the internal information system was considered by many to be the best and most important source of export marketing intelligence - indeed, seven exporters depended entirely upon internally-generated export intelligence. Five of these exporters were firms with extensive overseas sales and service networks which doubled as information collection systems. For example, one U.S. exporter stated that 99.9% of its export marketing intelligence was fed in from its overseas sales subsidiaries, which completely covered the Eastern Hemisphere. Other exporters reliant on their internal information systems tended to draw information from a number of sources, including their sales offices, salesmen, agents and other contacts in the industry. For example, several exporters commented on the ability of agents to provide information about a project at an early date, as one pointed out :

"Everything is done underhand in, for example, India, and our agent will have an enquiry the day before it is out."

However, the internal system was also considered the most important information source by several exporters with far less extensive sales organisations,³⁴ which considered that their more limited number of points of contact with the market place were nevertheless sufficient given the small number of important customers for their product(s).

Undoubtedly, the main advantage of the marketing intelligence provided by internal information systems was that it was up-to-date and therefore more useful than that reported in the trade press and provided by external organisations such as the OSO and the BOTB. For example,

33. See Table 10.6 (above).

34. For example, two exporters were entirely dependent upon their relatively small team of salesmen for export marketing intelligence.

one exporter commented that compared with the information received from the BOTB "information from the guys in the field is news, and it's better". Moreover, evidence suggested that up-to-date export marketing intelligence (as provided by the internal information system but seemingly not by other sources) might indeed be a key factor in successful export marketing, in that the seven exporters content to rely entirely on their internal information systems included five of the seven firms which had exported more than one-third of their offshore-related turnover, while none of the exporters which failed to mention the use of internally-generated information had exported more than one-third of their offshore-related turnover³⁵ (or had achieved exports of offshore-related equipment worth more than £250,000 in the year for which data was collected). The exporters which had no internal information system consisted of four companies which relied entirely on published and/or external sources of information and two companies which did not receive any export marketing intelligence from any source whatsoever. All but one of these exporters were small firms with no prior offshore-related experience, which had had neither the time nor the resources to establish their own overseas communication networks.

10.4 Export Services

A number of organisations - including several government departments, banks, trade associations and chambers of commerce - provide a range of services aimed at assisting exporters to overcome some of the problems associated with exporting. Nevertheless, some exporters argued that the support given to exporters by the U.K. government was inadequate.³⁶ This section provides a discussion of the findings with respect to the utilisation of the export services provided by the government and other organisations by the exporters of offshore-related equipment surveyed.

Firstly, almost half of the exporters utilised the services provided by the OSO.³⁷ In all but one case this was primarily for the receipt

35. The association between the nature of the information sources utilised and exporting success is shown in Appendix 10.6.

36. See p. 195.

37. See Table 10.7. The OSO's export intelligence service was discussed in section 10.3.5, pp. 235-236.

of export marketing intelligence on a regular basis, the exception being a Scottish exporter which contacted the OSO only from time to time whenever it needed more general advice. Analysis revealed that only 2 out of 8 small exporters utilised the OSO, compared with 10 out of 17 larger companies. Indeed, one small company was of the opinion that the OSO was absolutely no use whatsoever to the small to medium-sized business :

"They are only interested in orders of £100,000 or more. They push the large companies all the time. I've told the assistant director-general myself that they're not worth the money we are paying for them in tax."

TABLE 10.7
Export Services Utilised

Export Services Utilised	Number of Exporters
BOTB, of which	13
- Trade fairs & exhibitions	(8)
- EIS	(7)
- Other	(4)
OSO	12
ECGD	11
Trade Associations	3
Banks	3
Chambers of Commerce	2
None	5

SOURCE : Interview data

Part of the explanation for the greater usage of this service by the larger firms could lie in the fact that the OSO has, due to financial constraints, only undertaken to provide information concerning major offshore developments overseas.³⁸

Similarly, although relatively few exporters used the export services provided by their trade associations and banks, those that did were

38. Leaving the EIS to handle the flow of information concerning smaller contracts - see p. 109.

primarily interested in the export marketing intelligence these organisations could provide, although banks were also used to check the credit-worthiness of potential customers and to arrange meetings with key customers in export markets. The exporters using the services provided by their chambers of commerce were both U.S. subsidiaries, one of which arranged representation on its chamber's stand at exhibitions while the other contacted its chamber of commerce whenever it encountered problems with respect to, for example, export documentation.

Altogether, just over half the exporters used at least one of the BOTB's export services.³⁹ In addition to those exporters utilising the information service (EIS)⁴⁰ and taking advantage of the assistance provided for overseas trade fairs and exhibitions,⁴¹ a few used other services, including the translation service provided by Technical Help to Exporters⁴² and the overseas publicity service provided by the BOTB's publicity unit.

Further analysis revealed that only 3 of the 8 small exporters used any of the BOTB's range of export services, compared with 10 of the 17 larger companies. For example, only 2 of the 8 exporters taking advantage of the BOTB's support for trade missions and exhibitions were small firms, and it was interesting that a third small exporter which had planned to participate in a trade mission to Pakistan had withdrawn because it was still too expensive, even with the government subsidy. Similarly, of the 7 exporters using the EIS only 2 were small firms. If it is accepted that export services are likely to be utilised by those firms which expect to benefit most from them, then this evidence conflicts with the hypothesis that the export services provided by the BOTB are most useful to small companies.⁴³ Nor was there any evidence to suggest that the BOTB's export services were particularly useful for new exporters, nor that they tended to be more utilised by those firms less heavily involved in offshore-related exporting.

39. See Table 10.7 (above).

40. See Section 10.3.5.

41. For further details, see section 10.3.3.

42. A department of the British Standards Institution sponsored by the BOTB.

43. See p. 96.

Nearly half the exporters had taken advantage of at least one of the export services provided by the ECGD.⁴⁴ Firstly, the ECGD had provided several of the exporters with guarantees for credit financing (that is, had furnished unconditional guarantees of 100% repayment to banks, allowing them to provide finance to exporters at favourable interest rates). However, this service was heavily criticised, with even one of its regular users providing a list of complaints, as follows :

"It takes time to get them interested but at the tender stage we haven't got time. Also they want to wait for proof of what the competition are doing so they can match it, but it's difficult to get proof. Also, the period of loans we get is shorter - our competitors get 8, 10 or 12 years for smaller values than we can obtain. Finally, the ECGD only cover 80% of U.K. content, if more than 20% is non-U.K. it won't cover it. But if you want to get into some markets you must have domestic content, it may be 40% but you can't get that covered."

In fact, as has already been pointed out, some firms regarded their inability to provide their customers with competitive credit financing as a problem influencing export performance,⁴⁵ a fact illustrated by the following remark :

"If I want financing over 15 years they'll offer 7 years and say 'but if your competitors are getting more, we'll match it'. Therefore you're always coming up from behind. We're never in front as far as financing is concerned."

The ECGD had also insured several exporters against the risk of non-payment by overseas customers. While one exporter described the ECGD insurance as essential, another remarked that it was "first class ... there's no way we would export without it." On the other hand, it was also argued that since the U.K. had joined the E.E.C. its usefulness had declined, while one user declared that "some countries in which we'd like to think we could get risk cover are no longer covered". Furthermore, the ECGD export insurance scheme was also criticised for being aimed at large exporting contracts, with one exporter remarking that "the ECGD is only concerned with business of more than £2 million or two years' duration". The claims that the ECGD is primarily interested in large, long-term contracts and is

44. See Table 10.7 (above)

45. See p. 195.

therefore large company orientated were supported by the fact that only one of the small exporters took advantage of either of the ECGD services.

Thus, all the export services provided by the OSO, BOTB, ECGD and other organisations received a significant amount of criticism and even the most popular among them were taken advantage of by less than 50% of the exporters surveyed. Although the fact that all the export services were found to be less utilised by small firms than by large and medium-sized firms was itself of note, this finding was particularly interesting with respect to the services offered by the BOTB, an organisation which, it has previously been suggested,⁴⁶ concentrates on supporting the efforts of small and medium-sized firms and new exporters.

10.5 Export Organisation

This section presents an examination of the way in which the offshore-related exporters surveyed organised their exporting activities.

Firstly, five of the exporters were found to accommodate exporting within their existing domestic marketing department. Although one of these exporters did undertake personal selling in export markets on a regular basis, the remainder were those firms which were exporting only indirectly (through either agents or the Aberdeen subsidiaries of multinational supply companies) and which treated exports as being the same as domestic business. For example, none of these firms employed a single person with specialist export training. For each of these exporters, exports of offshore-related equipment represented only a relatively small proportion - 3-25% - of total offshore-related sales, a result which is consistent with the proposition that when export business accounts for only a small proportion of total sales exporting is likely to be accommodated within the existing marketing department.

Surprisingly, only one exporter had an export department in addition to a sales department for the domestic market. Although several other exporters had formerly been organised on an export/domestic

46. See p. 96.

basis they had been re-organised, and indeed, the remaining 19 exporters all claimed to be organised on a global basis and to display what one exporter described as a "worldwide attitude to sales". The low incidence of the existence of an export sales department appeared to be the result of three main factors: the technical nature of the activities associated with marketing offshore-related equipment; a low regard for specialist exporting training and expertise; and the international nature of the oil industry. For example, one Scottish exporter explained that the reason it had a "marketing department" consisting not of export sales representatives but of "professional sales engineers" (who spent roughly one-quarter of their time overseas but had no export training) was that ...

"it's a technical business therefore we need qualified sales engineers, they must know every single detail about the product".

Typical of the remarks discrediting the importance of specialist exporting expertise was the following comment made by a U.S. exporter :

"The most staff have to do is to handle the financial or shipping documents and they have sufficient expertise for that. Other than that they don't need any special export expertise. All you need to know is the right people."

It was noticeable that the one export department which had been established appeared to be inadequate in that it consisted of just five employees, only one of whom undertook overseas sales trips. However, there was also evidence that some of the exporters which claimed to be organised on a "global basis" and to display a "world-wide attitude to sales" tended to be less willing to commit resources to the development of overseas markets than to the domestic market, in that in some firms there was clearly an imbalance between the strength of the sales forces assigned to export markets compared with those allocated to the domestic market. For example, the marketing director of one exporter which had a total sales force of a dozen covering Europe admitted that having six of these designated to the U.K. market was five too many, while a U.S. exporter confessed that it did not receive small export orders because it had ...

" ... fewer men overseas than over here. The men overseas only have time to deal with our large customers. They're not selling down to the same/

/level of customers because there are not so many of them over there covering the territory."

Thus, the exporters which integrated exports into their domestic marketing operations were involved in offshore-related exporting only on a minor scale. Of the other exporters, only one had an export department as such, the rest generally stressing the international nature of the oil business and the necessity therefore of being organised on an international basis and of adopting a global attitude, rather than discriminating between export and domestic sales. Furthermore, several exporters argued that the importance of specialist export training was reduced by the close-knit nature of the oil community which resulted in the salesman's technical knowledge and his contacts in the oil industry being of prime importance. The only exporting expertise generally considered relevant appeared to be the knowledge of shipping and financial documentation held by the clerical staff located in Scotland. Finally, despite the fact that a large majority of the exporters surveyed claimed to have adopted a 'global attitude' to sales, there was nevertheless evidence that some of these firms did discriminate against exports in that they failed to commit resources to the development of overseas markets to the same extent that they did the domestic market.

10.6 CONCLUSION

The analysis (presented in section 10.3) of the data concerning the export marketing methods utilised by the 25 offshore-related exporters revealed that there was an association between the export marketing programme implemented and offshore-related export performance. In particular, although there was no clear evidence that the choice of pricing or product adaptation policy influenced exporting success, there was substantial evidence of an association between the export marketing research, promotion and distribution methods utilised and export performance.⁴⁷

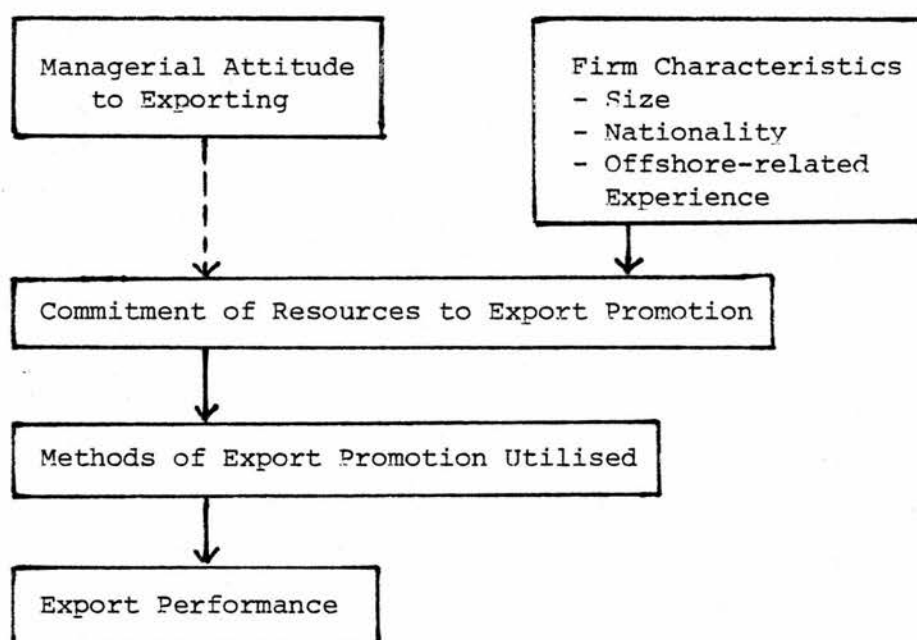
As far as methods of promotion are concerned, although most exporters

47. The influence exerted on export performance by the nature of the product was clearly identified in sections 9.2 - 9.6.

regarded personal selling as the first essential, to a certain extent the various methods of promotion were seen as performing different functions, with the result that most exporters utilised several methods of export promotion. Moreover, a strong association was found between the number of methods of export promotion used and export performance (as shown in Figure 10.1).

FIGURE 10.1

Factors Influencing the Methods of Export Promotion Utilised
and Export Performance



If the number of methods of export promotion utilised is taken as a rough measure of the resources committed to export promotion by the surveyed exporters, this result can be interpreted as indicating an association between export performance and the level of promotional activity undertaken. In addition, there was substantial evidence that small firms simply did not have the necessary resources to utilise a wide range of methods of export promotion and, in particular, could not afford to undertake personal selling activity on an effective level.⁴⁸ There was also some evidence to suggest

48. Firm characteristics have already been shown to be closely inter-related and hence it was not surprising that relationships were also found to exist between the number of methods of export promotion utilised and firm nationality and previous offshore-related experience.

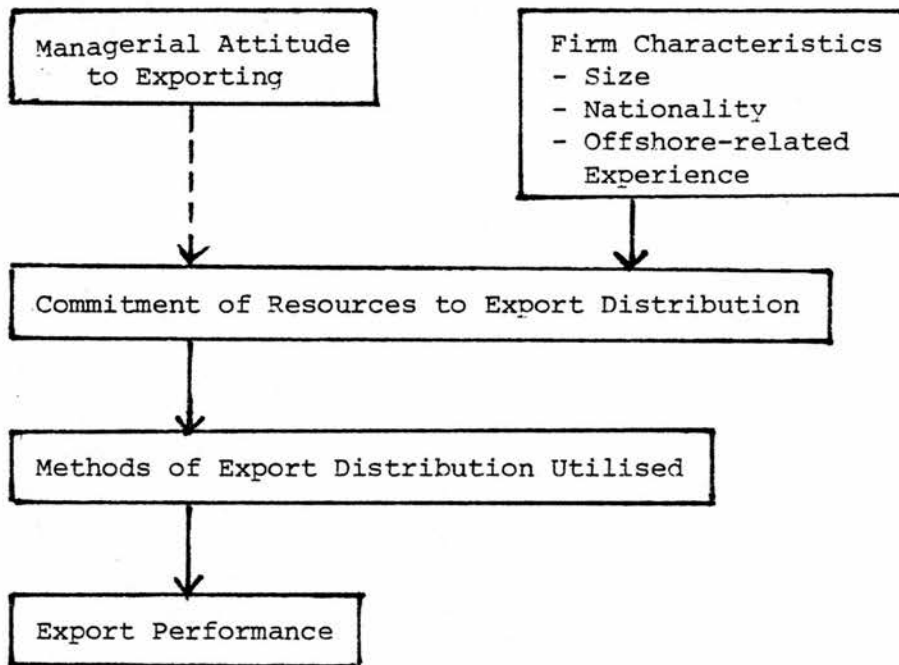
that there might be an association between managerial attitude to exporting and the amount of export promotion carried out, in that those firms which had adopted a passive attitude to exporting had failed to commit any resources whatsoever to the promotion of export sales.⁴⁹

As discussed in section 10.3.4, evidence was also found of an association between export performance and the method(s) of export distribution utilised, with those firms which exported direct to overseas customers (particularly those which had established their own sales and service subsidiaries overseas) generally being more successful in offshore-related export markets than those firms which exported through intermediaries and carried out no direct selling overseas. The distribution methods involving direct contact with export markets do, of course, require considerable investment in exporting, and there was clear evidence that some small firms simply did not have the resources to employ even a single export sales representative, far less be able to afford to establish permanent bases overseas. Moreover, even a large company newly-established in the offshore supplies business will require a substantial period of time to develop its own sales and service network appropriately located to serve its oil industry customers. Hence, the U.S. subsidiaries, which are part of large organisations with lengthy offshore-related experience, might be expected to have more highly developed distribution networks than newly-established British firms of any size. However, part of the observed difference in distribution methods utilised by exporters of different nationality could not be attributed to differences in either the size or experience of the respective organisations, in that in certain large, established British companies the development of overseas distribution networks appeared to have been influenced by an unwillingness to risk resources in export markets. In addition, it was noticeable that the exporters which had adopted a passive attitude to exporting had both chosen to avoid committing resources to export distribution, having decided instead to export through middlemen. Thus, although the commitment of resources to export distribution (and hence the methods of export distribution used) was influenced by the nationality, size and offshore-

49. As only two exporters had adopted a passive attitude to exporting, this finding must be regarded as being tentative, and hence is shown in Figure 10.1 as a broken line.

related experience of the exporter, there was some evidence that it might also be affected by managerial attitude to exporting.

FIGURE 10.2
Factors Influencing the Methods of Export Distribution
Utilised and Export Performance

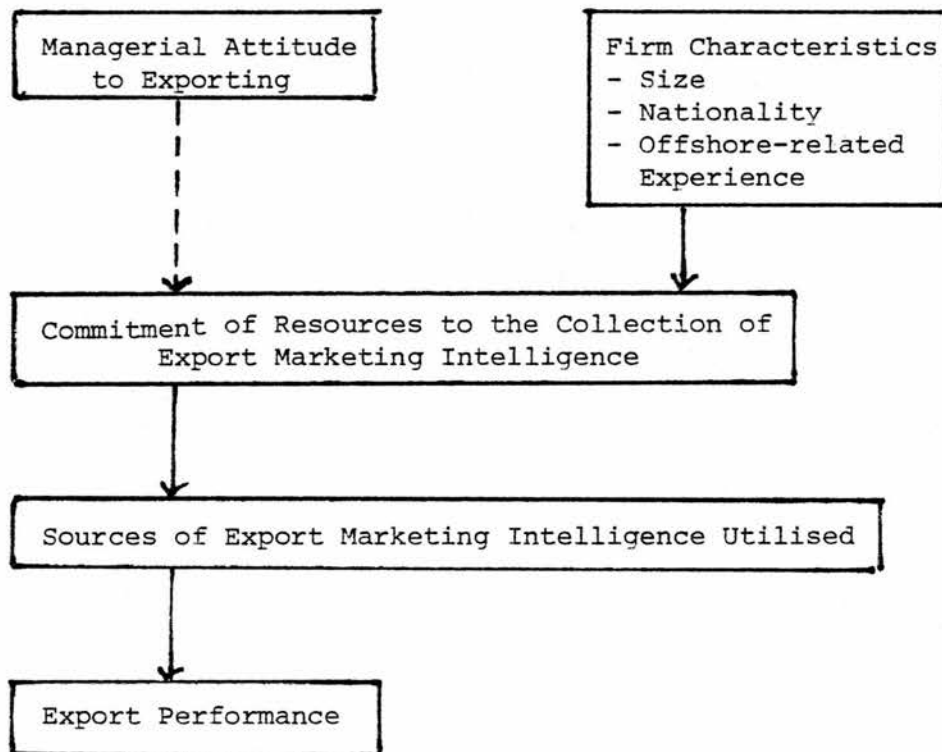


Finally, export performance was found to be associated with the nature of the sources of export marketing intelligence utilised, with those firms with an established internal information system (providing up-to-date export marketing intelligence) generally being more successful in overseas markets than those exporters reliant on external or published information sources. These internal information systems were, of course, built upon these exporters' export distribution networks, with their overseas offices acting as the main collection points for up-to-date marketing intelligence gleaned from salesmen, agents and other contacts in overseas markets. Hence, only those exporters which had committed resources to the development of export markets were rewarded with the up-to-date

marketing information regarded as a key input for successful export marketing, and once again, it was the small, inexperienced (mainly Scottish) offshore-related exporters which were at the greatest disadvantage, having had neither the time nor the resources to establish their own overseas communication networks. Thus, the investment of resources in the establishment of internal communication networks (and hence the sources of export marketing intelligence utilised) was found to be influenced by the nature of the firm. It should also be noted that, having chosen to export through middlemen, the exporters whose managements had adopted a passive attitude to exporting had no direct contact with overseas markets through which to collect export marketing intelligence.

FIGURE 10.3

Factors Influencing the Sources of Export Marketing Intelligence
Utilised and Export Performance

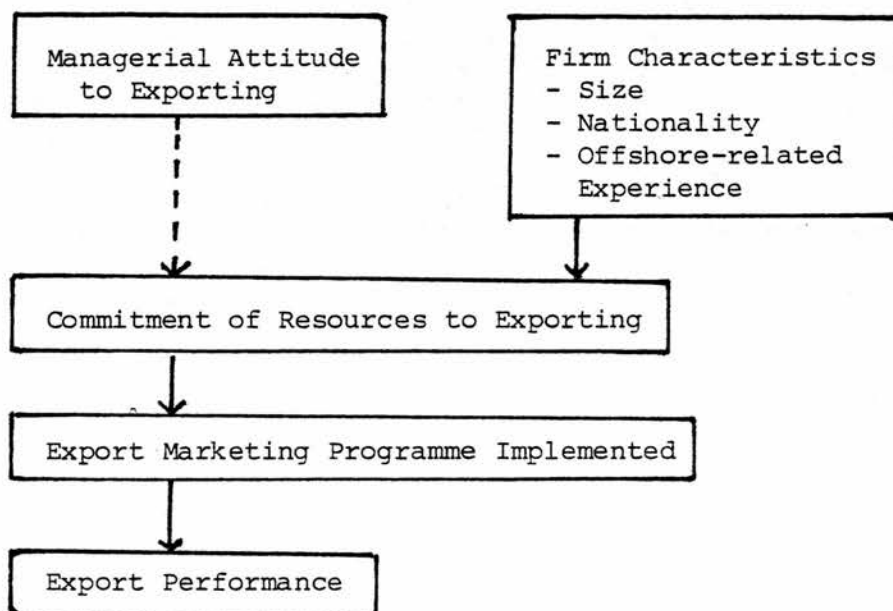


Thus, Figure 10.4, which summarises the relationships presented in Figures 10.1 - 10.3, shows that offshore-related export performance

will depend upon the nature of the export marketing programme implemented. However, the kind of exporting programme which has been shown in this chapter to be associated with offshore-related exporting success requires substantial investment in exporting. For example, an association was found between export performance and the level of promotional activity undertaken, while those exporters which had invested in the establishment of their own sales and service networks (and internal information systems) were generally more successful than exporters which had not undertaken investment of this nature. Whether the investment necessary for successful exporting was committed was found to be determined by two main groups of factors. First, there was some evidence that those firms which had adopted a passive attitude to exporting were less willing to commit the resources required for successful export promotion and distribution. Second, it was found that small firms often simply could not afford

FIGURE 10.4

Factors Influencing the Export Marketing Programme Implemented
and Exporting Success



to undertake a wide range of methods of export promotion or employ salesmen to sell direct to overseas customers, while the establishment of an appropriately located overseas sales and service network presented even larger companies newly-established in the offshore supplies industry with a problem which they could only solve with substantial investment over a considerable period of time.⁵⁰ That is, firm characteristics (particularly size) helped determine whether the resources necessary for successful exporting were made available. It was argued in Chapter 5 that small firms might be able to partly compensate for their lack of resources by taking advantage of the export services provided by a number of external organisations. However, as pointed out in section 10.4, the services provided by the BOTB, ECGD, OSO and other organisations were, in fact, found to be less utilised by small firms than they were by the large and medium-sized exporters. Hence it appeared that these export services did not provide a solution to the real problem of inadequate resources faced by small exporters.⁵¹

50. The evidence, presented in section 10.2, that small firms tended to be involved in a smaller number of markets than were larger firms provided a further indication that the export-related activities of small firms may be restricted by a lack of resources.

51. Since no clear association emerged between export performance and the use of export services, this variable has been excluded from Figure 10.4 above.

CHAPTER ELEVEN

WORLD OFFSHORE OIL AND GAS : 1980-85

11.1 INTRODUCTION

The previous three chapters presented an examination of the major factors influencing the export performance of the Scottish manufacturing sector of the offshore supplies industry. These results were based on an analysis of data collected during the course of in-depth, qualitative interviews in 40 firms located in Scotland manufacturing offshore-related equipment.

A second round of in-depth interviews was later undertaken in the same group of firms in order to identify possible future trends in the offshore-related exporting activity of these manufacturers in the period 1980-85. It was stressed in Chapter 9 that in some of the surveyed firms managerial attitude to exporting was found to be influenced by management's perception of future market trends (and the resulting level of capacity utilisation).¹ For this reason it was considered necessary to develop a reasonable hypothetical scenario of the global offshore market for the period 1980-85, upon which the respondents could base their replies concerning their expected strategy during this period.

While the following chapter provides an analysis of the expected strategic response of the sample to the scenario presented to them, this chapter is devoted to a discussion of the scenario itself. The scenario was based upon published data supplemented, where appropriate, by interview data resulting from a survey of expert opinion. However, it was, of course, impossible to predict what would happen to world offshore oil and gas activity in the period 1980-85, as the future is uncertain. Hence this scenario - an internally consistent, plausible account of a future market situation - represents no more than one view of what could happen in the offshore market during this period, given certain assumptions.² Moreover, it should be noted that although the scenario presented in this chapter was prepared in January 1980, no

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1. This was consistent with the findings of previous exporting studies, such as Cooper et al (1970) and Majaro (1977).
 2. An attempt has been made to clearly identify the assumptions which underlie the scenario.

attempt has been made to update it as the final phase of interviewing was undertaken on the basis of the global market situation as detailed in the original scenario. The full scenario presented in this chapter was, however, too long and detailed for presentation to the respondents, who were instead supplied with a summary of its most relevant points.³

This chapter commences with a brief discussion of the world energy situation which concludes that the demand for oil will increase slightly over the period to 1985. In Section 11.3 the reasons for the gradual movement towards offshore oil and gas activity (and the corresponding increase in expenditure on offshore oil and gas operations) are outlined. Finally, Sections 11.4 and 11.5 provide a review of the major areas of offshore activity.

11.2 WORLD ENERGY 1980-85

The political upheavals in Iran and their impact on the supply and price of oil provided a reminder that the timing and nature of such shocks to the world economy are unforeseeable. Consequently, projections of energy supply and demand have undergone considerable revision in recent years. For example, in 1973 Exxon projected that demand in the 'free world',⁴ which at that time was equivalent to 86 million barrels per day of oil (b/doe), would rise to around 165 million b/doe by 1985 (Dafter, 1979d). However, the rate of growth in total energy demand fell dramatically from 5.5% p.a. in 1965-73 to 1.7% p.a. in 1973-78 (Lascelles, 1979a). As a result, a recent forecast by Shell suggested that energy demand in 1985 will be no higher than 108 million b/d (S.B.S., 1979a).

Recent economic growth forecasts have been gloomy. For example, the E.E.C.'s Annual Economic Review 1979-80 anticipated that the average rate of growth in 1980 in the E.E.C. as a whole would be 2%, the lowest since 1975 (Dafter, 1979b). A major factor contributing to this bleak outlook is the assumed continuation of OPEC control over the supply of oil, thereby eliminating the possibility of a significant

3. A copy of this summary is provided as Appendix 7.8.

4. That is, excluding the USSR, Eastern Europe and China.

reduction in its price in real terms.

In the past economic growth and energy growth have proceeded roughly in unison. However, during the period 1973-78 energy consumption per unit of GDP for the OECD fell by 7% (S.B.S., 1979c). Furthermore, several studies have concluded that conservation measures are competitive with both present energy prices and the costs of future supply alternatives, and have suggested that reductions in energy consumption per unit of GDP in the region of 25-40% are feasible, although substantial savings will take a number of years to materialise given the slow turnover of energy using equipment (S.B.S., 1979c; Fraser, 1978; Dafter 1979f). However, several countries (including the U.K.) have decided against the introduction of compulsory conservation measures at this stage. This evidence seems to support the argument put forward by Odell & Vallenilla (1978, p.83) that there are "serious political barriers" to be overcome before substantial conservation gains can be made, as effective conservation does eventually mean changing people's habits, and "few governments, anxious about the results of the next election seem willing to go so far out on a limb." Given that the easiest and most acceptable conservation measures will be implemented first it seems likely that in the period 1980-85 energy savings will continue to be significant but will fall short of the 25-40% reductions considered feasible over a period of around 20 years.

Table 11.1 shows clearly that little change in the relative contributions of the various energy sources is anticipated by Shell in the 1978-85 period, with oil continuing to meet the greater part of the world's energy needs. The continuing dependence on oil can be clearly explained. First, on the demand side, almost all non-Communist countries have created systems, both technical and societal, which run on oil (and natural gas). These energy sources can only be replaced very gradually because of the immense costs involved and also the societal distress and resistance that would result from their replacement by alternatives incapable of sustaining the complete range of activities to which western societies have become accustomed (Odell, 1979a). On the supply side there are considerable constraints inhibiting the speedy development of other energy forms. For example, in most countries it would take at least 10 years to plan, gain approval

for and complete major energy projects such as nuclear power stations and large coal mines.

TABLE 11.1
Free World Energy Demand
1978 - 1985

	1978		1985	
	million b/doe	%	million b/doe	%
Oil	49	53.8	56	51.9
Gas	15	16.5	17	15.7
Coal	17	18.7	21	19.4
Nuclear	3	3.3	6	5.6
Hydro- electricity /other	7	7.7	8	7.4
TOTAL	91	100.0	108	100.0

SOURCE : This table is based on Shell Briefing Service (1979a), Figure 1, p.3.

11.2.1 Nuclear Energy

The modest increase in nuclear power shown in Table 11.1 above will result from the commissioning of plants already at or beyond the planning stage. Nevertheless, this expansion is by no means assured as nuclear programmes worldwide have consistently failed to meet targets. In addition, concern over radioactivity and the proliferation of nuclear weapons appears to be mounting in a number of western countries as a result of the failure to find a satisfactory solution to the problems associated with the large-scale disposal and/or conversion of nuclear waste products, while the safety of the reactors themselves has been questioned following leaks at reactors in several countries. Furthermore, while some authorities, such as the C.E.G.B.

and Shell (1979a), stress that nuclear power is a fully commercial proposition, others such as Odell & Vallenilla (1978) disagree, and some opponents even claim that true costs are being systematically hidden and denied (Counter Information Service, 1978).

11.2.2 Coal

As coal is less clean and convenient than oil, gas and electricity, over a period of time in competition with cheap oil coal's share of world energy supplies fell significantly. However, coal is now a relatively cheap (and abundant) energy source and consequently the downward trend should be reversed in the period 1978-85 (S.B.S. 1979a). However, expansion can only be very gradual given the long lead times associated with developments in new areas and the neglect of the technology of coal production and consumption which has occurred as a result of the industry's decline over the last 25 years (Odell, 1979b). There is also strong environmental opposition to coal because of the landscape damage resulting from its extraction and the pollution arising from its combustion, while working conditions underground are becoming increasingly socially unacceptable. Finally, considerable investment by energy users would be required to convert existing oil and gas facilities to coal, and although liquefaction and/or gasification of coal may eventually solve this problem they will not have a significant effect in the period to 1985.

11.2.3 'Alternative Energies'

Hydroelectricity, which currently contributes around 6 million b/doe has already been introduced at most sites which are suitable in the industrialised countries. Development in the LDC's, where potential still exists, is likely to be a slow process (S.B.S. 1979a). Alternatives such as solar, wind, geothermal, tidal and wave energy are currently uncompetitive except under particularly favourable conditions (such as the use of solar energy for small power plants serving consumers in cloudless areas remote from power networks). Also they are usually highly localised and often need storage systems to ensure continuity of supply. The exploitation of tar sands does now produce oil at competitive prices and is therefore likely to be expanded, but studies have shown that production of other 'synthetic' fuels (such as alcohol

from sugar cane) is likely to remain uncompetitive with fossil fuels in the foreseeable future (Fishlock, 1979; S.B.S. 1978b). Thus, in general, 'alternative' energies require considerable development and their contribution in the period to 1985 will be minimal.

11.2.4 Natural Gas

It can be seen from Table 11.2 (below) that total world proven natural gas reserves⁵ at the end of 1979 were estimated at 72,865 billion cubic metres (m^3), equivalent to approximately 450 billion barrels of oil⁶ and over 50 years supply at the current rate of consumption of 1325 billion m^3 per annum (S.B.S. 1979e).

TABLE 11.2

World Natural Gas

	Reserves (1979)		Consumption (1978)	
	Billion m^3	%	Billion m^3	%
North America	7914	10.9	580	44
Western Europe	3833	5.3	205	15
Japan/Australia/ Far East	3630	5.0	35	3
Middle East	20964	28.8	80	6
Africa	5956	8.2		
Latin America	4092	5.6		
U.S.S.R.	25485	35.0	425	32
China/Eastern Europe	991	1.4		
TOTAL	72865	100.0	1325	100

SOURCES : (1) Reserves - Oil & Gas Journal, 31.12.79, pp 70-71
(See Appendix 11.1).

(2) Consumption - S.B.S. (1979e), pp. 6-7.

5. These are recoverable reserves, that is, that proportion of the physical volume of gas present in the rock which can be extracted under given technological and economic conditions.

6. 1 billion m^3 = 17,000 barrels of oil per day (Shell, 1978a, p.64).

Although there is no resource constraint on the supply of natural gas, it should be noted that 35% of the world's natural gas reserves are situated in the U.S.S.R. while a further 35-40% are controlled by members of OPEC. Thus much depends upon the policies these countries adopt with respect to the balance between exports, local consumption and resource conservation.

The imbalance between resource base and consumption identified in Table 11.2 (above) also highlights the significance of the difficulties experienced in the transportation of natural gas. Most of the gas currently used is transported by pipeline and consumed in or near the country of origin and the transportation of gas from remote areas to the main consuming markets continues to present problems of a technical and financial nature. Liquefaction of the gas at very low temperatures is currently the only economic and proven method of reducing natural gas volumes sufficiently for bulk transport by ship, in special LNG carriers. Although this system involves considerable investment, LNG trade is expected to increase from 27.9 billion m³ (or 475,000 b/doe) in 1977 to 100 billion m³ (1.7 million b/doe) in 1985 (S.B.S., 1979a). LNG shipments are currently made from Algeria to the U.S.A., from Algeria and Libya to Western Europe and from Alaska, Abu Dhabi, Indonesia and Brunei to Japan. However, continuing energy price rises should increase the economic radius for new gas supplies and by 1985 there should be additional services from Algeria and Nigeria to Western Europe and the U.S.A., while further services from the Middle East and Far East to Japan, the U.S.A. and Europe are among those currently under consideration.

Thus, to summarise, natural gas consumption in the 'free world' is expected to grow at approximately 1.5% per annum to reach 1000 billion m³ (or 17 million b/doe) by 1985. As many indigenous gas fields in the U.S.A. and Western Europe have reached or are approaching peak production, this growth projection assumes not only that LNG import projects will be developed where politically and economically feasible but also that exploration for and development of new gas deposits (especially in areas accessible for pipeline supply to the major consuming markets) will be stimulated.

11.2.5 Oil

In 1979 world proven oil reserves totalled around 640 billion barrels, equivalent to around 30 years supply at the 1979 rate of production of 62.6 billion b/d (of which 48.4 million b/d came from non-Communist countries).⁷

OPEC holds the key to future oil supplies and prices. Apart from OPEC's control (in 1979) over almost 70% of the world's oil reserves⁸ and approximately 50% of total world production,⁹ OPEC's power stems from the dependence of the industrialised world's technologies and lifestyles on an uninterrupted supply of oil and the absence of a cheap alternative energy supply that can be substituted for oil.¹⁰ The absence of a suitable alternative results in the demand for oil being 'price inelastic', that is, an increase in prices brought about by collective action does not produce an equivalent reduction in the quantity purchased, causing the income of OPEC producers to rise.

During the 1970s OPEC members appeared to undertake a major reappraisal of what they believed to be in their own interests and it is anticipated that they will want to maintain pressure on the supply and demand balance by trimming production as necessary (compensating themselves with higher prices). In this way they will be able to continue to exert political pressure, force up prices even higher and spin out their reserves over a longer period.

In the two decades prior to 1973 demand for oil increased at more than 7% per annum. However, the 5-fold increase in the price of crude oil which occurred in the period 1973-75 in the context of a major world recession caused the rate of growth of demand for oil in the free world to fall to around 1% per annum post 1973 (Odell, 1979a). Given the existing conditions of real rising energy prices, economic recession and encouragement of energy conservation, the outlook for demand seems unlikely to change to any significant extent, at least in the next 2 - 3 years. Certainly the 2% per annum growth assumed by Shell for the period 1978-85¹¹ appears optimistic.

7. See Appendix 11.2.

8. Almost 80% of the 'free world's' oil reserves.

9. 60-65% of 'free world' oil production.

10. As discussed in the previous subsections of 11.2.

11. As shown in Table 11.1 above.

Thus, the researcher's 'best estimate' of the 1985 energy pattern, shown in Table 11.3 (below), assumes an overall 1% per annum growth in the demand for oil and 2% per annum growth in energy demand in general over the period 1978-85. However, it is very unlikely that oil demand will grow at a steady rate throughout the period, but rather that the considerable 1979 price increases will result in a fall in oil demand in 1980, with the rate of growth in oil demand then accelerating to around 3% per annum by 1985.

TABLE 11.3

Estimated 'Free World' Energy Demand in 1985

	1978		1985	
	million b/doe	%	million b/doe	%
Oil	49	53.8	53	50.5
Gas	15	16.5	17	16.2
Coal	17	18.7	21	20.0
Nuclear	3	3.3	6	5.7
Hydro-electricity /other	7	7.7	8	7.6
TOTAL	91	100.0	105	100.0

SOURCE : Researcher's own estimate based on published information and interview data.

11.3 WORLD OFFSHORE OIL AND GAS ACTIVITY 1980-85

In the past oil exploration and production has been highly concentrated geographically in the U.S.A., the U.S.S.R. and the Middle East.

Indeed, approximately 80% of all exploration has been undertaken in the U.S.A., and this figure rises to over 90% with the inclusion of the U.S.S.R. and the Middle East (Odell, 1979b). This situation has arisen partly from the attempts of the major oil companies to maximise production from politically stable regions of the world and partly from the ready availability of low-cost resources in the Middle East.

However, Odell (1979a) argues that the politico-economic conditions that produced this profile have disappeared, so that a geographically dispersed pattern of production could now be developed. The basic element in the new situation is the higher price of oil, which has now been pushed well above the long-term supply price of the quantities which seem likely to be demanded - that is, the price of oil is now much higher than that necessary to bring new supplies on to the market. Thus, non-OPEC nations which have experienced considerable economic difficulties arising from large increases in their oil import bill and fear for the future security of supplies are likely to attempt to make themselves more independent of the oil policies implemented by OPEC by increasing the rate of development of their indigenous oil and gas resources. The drive to develop sources of non-OPEC energy is reflected in the large slice of Euro-market activity taken up by energy-related lending in syndicated loans (Evans, 1979). In addition, the search for new energy resources in Third World countries is receiving high priority among a number of international organisations, including the World Bank which will double its lending for oil and gas development in the Third World from approximately £220 million in 1979/80 to £440 million per annum by 1983 (Dafter, 1979b). Third World countries may, in fact, encourage oil activities not only as a long term source of oil (and revenue) but also as a short-term source of foreign capital for licence fees etc. which are not insignificant even when no finds are made (Gaffney, 1976).

However, even assuming oil is discovered, there is normally a considerable time-lag (of perhaps four years) before the first oil production is achieved. Indeed, Shell anticipate that in the period 1979-90 up to 80% of the world's oil will come from existing fields. New production will also come from so-called 'low cost' locations, such as the Middle East, Mexico and the rest of Latin America. Nevertheless, most countries of the world will be stimulated to increase their efforts to develop indigenous supplies of oil and gas, while the world's continental shelves represent an area which has been largely neglected in the past from the point of view of oil exploration and development. Therefore, it appears logical to anticipate a gradual shift in oil and gas activity to offshore areas, especially given the continual advancement of offshore-related technology.

Indeed, a gradual movement towards offshore activity is already in evidence. In 1973 offshore production totalled only about 8.3 million b/d, around 15% of total world oil production, but by 1976 had increased to around 12 million b/d, approximately 20% of total oil production (Shell, 1978). As shown in Table 11.4 (below), by 1979 offshore oil production had expanded to 13.8 million b/d, equivalent to 22% of total world oil production, while it has been estimated¹² that by the late 1980s offshore supplies will account for 30-35% of world oil production (Done, 1978). The proportion of natural gas production coming from offshore areas has also increased, from around 10% in 1973 to about 17% in 1979 (Dafter, 1979a). Thus, by 1985 approximately 25% of world oil production and 20-25% of world gas production may be coming from offshore fields.

TABLE 11.4

Estimated Offshore Oil Production (1979)

Area	million b/d	%
North America	1.73	12.5
Central America & West Indies	0.43	3.1
Western Europe	1.90	13.8
South America	1.93	14.0
Africa	1.19	8.6
Middle East	4.67	33.8
Far East & Australasia	1.56	11.3
Communist Nations	0.40	2.9
TOTAL	13.82	100.0

SOURCE : Various - See Appendix 11.3.

12. By Dr. J. Birks, Managing Director of British Petroleum.

At this point it is worth noting several other developing trends. Firstly, future oil discoveries are likely to be much smaller than the 'super giant' fields, 30 of which account for 50% of the world's reserves (Dafter, 1979c). Secondly, although oil demand may grow at a slower rate in the future, capital needs will grow exponentially. For example, it has been estimated¹³ that more than £50 billion per annum could be spent on the development of oil production in non-Communist countries by the year 2000, compared to the £8 billion to be spent in 1980¹⁴ (Dafter, 1979e). This is principally because most of the 'easy' and 'cheap' oil reserves have almost certainly been found and production from many such oil fields will be kept below the technically possible limits. Thus the industry is being forced to attempt to increase the amount of oil that can be recovered from existing fields¹⁵ and to find and exploit more difficult and expensive resources. Finally, developing more inaccessible oil means that projects will take far longer to bring to fruition.

These trends are reflected in the increase in expenditure on offshore oil and gas activities from approximately £1.2 billion in 1972 to more than £4 billion in 1977 and around £6 billion in 1979. Looking ahead, Dr. Birks of B.P. has estimated that offshore expenditure over the period 1978-90 could total around £200 billion (Done, 1978). Thus, the evidence suggests that offshore expenditure will increase to around £10 billion per annum by 1985.¹⁶

Having identified the general trends contributing to an expanding offshore market, the sections below provide a 'broad brush' review of the major areas of offshore activity. As the majority of expenditure on offshore-related equipment is associated with new offshore developments the review will concentrate on those areas in which major offshore developments are expected to take place over the period 1980-85. This is nevertheless a complex exercise as development activity is a difficult variable to predict, particularly beyond 1983. Indeed, the difficulties inherent in such an exercise are underlined by the list of factors which should be taken into consideration, including past and present production and consumption patterns; activity

13. By Mr. Dirk de Bruyne, President of the Royal Dutch Petroleum Company.

14. Constant 1979 prices.

15. Enhanced recovery techniques cannot, however, be expected to add significantly to production in the period to 1985, principally because of the high cost of oil recovered using these techniques relative to current oil prices (S.B.S., 1979c).

16. Constant January 1980 prices.

planned and announced by oil companies and governments; published evaluations of the geology of the areas; the general tendency to maximise production near major consuming areas (especially with regard to gas); the attraction of areas where finds are expected to consist of low sulphur, light crudes; and the attraction of politically stable regions. Moreover, as was shown above,¹⁷ expenditure on oil equipment and services in general will depend not only on the number and scale of offshore developments undertaken, but also on an area's physical environment - the weather conditions, water depth, distance to shore and so on - and the available technology and its cost given the quality of the oil-bearing province and its physical environment.

11.4 THE U.K. CONTINENTAL SHELF

Treasury estimates indicate that capital expenditure on oil and gas production - excluding exploration drilling - should decline rapidly from approximately £2 billion per annum in 1979-80 to around £1 billion per annum by 1985 (Economic Progress Report No. 112, p.3). In view of the December 1979 oil price rises this view seems unduly pessimistic.

On the other hand, the forecast made in December 1979 by Wood Mackenzie & Co., the Edinburgh stockbrokers, that up to 19 platforms will be ordered in 1980-81, appears somewhat optimistic. They envisage three platform orders being placed in 1980 for the Brae, N. Beryl and Hutton fields, and contracts for up to 16 structures being placed in 1981 for the Alwyn, Andrew, SE Auk, Indefatigable, S. Montrose, Morecambe (five or six platforms), Rough (three platforms), 'T-Block' and 30/17b fields.

The author's research suggests that as at January 1980 the most likely pattern of field developments (and platform orders) is as shown in Table 11.5 below. It should, however, be emphasised that the projection of field developments even 12 months in advance is extremely difficult. Hence Table 11.5 is no more than a 'best estimate' made on the basis of the limited information available and is therefore likely to be subject to a substantial margin of error.

17. See section 2.2.

TABLE 11.5

U.K. Offshore Field Developments, 1980-85

Year	Field/Operator	Estimated Development Cost (£m; 1979 prices)	Remarks
1980	N. Beryl - Mobil	500	250-300 million barrels recoverable oil; steel platform order expected Spring 1980; production late 1983; SBM.
	Brae (South) - Marathon	700	250-300m barrels recoverable reserves; steel platform order expected Summer 1980.
	Hutton - Conoco	600	250m barrels recoverable reserves; TLP order expected Winter 1980/81; production early 1984.
1981	S.E. Auk - Shell	100	50m barrels recoverable reserves; small steel platform expected; production 1983.
	S.E. Indefatigable - Shell	100	Small steel platform possible to boost production rates.
	Rough - BGC	150	Three small steel platforms may be ordered.
	Tiffany - Phillips	400	Main platform for T-block development; recoverable reserves totalling around 500m barrels.
	30/17b - BNOC	250	100-125m barrels recoverable reserves; steel platform expected; being developed with all possible haste.
1982	Alwyn (North) - Total	250	100-150m barrels recoverable reserves; further appraisal necessary before order for fixed platform is placed.
	Andrew - B.P.	200	100-150m barrels recoverable reserves; appraisal & feasibility studies continuing; difficult seabed conditions may result in a TLP being ordered

/ cont'd

TABLE 11.5 cont'd

Year	Field/Operator	Estimated Development Cost (£m; 1979 prices)	Remarks
1982	S. Montrose - Amoco	150	50m barrels recoverable reserves; appraisal continuing; small steel jacket probable.
	Morecambe (initial phase) - BGC	250	First phase calls for five small steel platforms and two pipelines; orders must be placed in 1981 to meet production target of 1983, but schedule probably too tight.
	14/20 - Texaco	250 (approx.)	Size uncertain & further drilling required; Texaco's next development after Tartan.
	3/7 - Chevron	50	Small, inexpensive development; possible tie-in to Ninian; appraisal in 1980; next Chevron development.
1983	Bruce - Hamilton	200 (approx.)	Gas/condensate field; development probably dependent on gas gathering system.
	Eider (211/16) - Shell	250	100-200m barrels; possible tie-in to N. Cormorant.
	S.W. Heather - Union	125 (approx.)	Size uncertain & further appraisal required; Union experiencing difficulties with Heather field.
	Thelma/Toni - Phillips	400	Further development of T-block requiring perhaps two further platforms.
	N. Thistle - BNO	75	50m barrels recoverable reserves; development apparently shelved until after 30/17b project.
1984	Brae B - Marathon	-	Possible further developments to north of current project.
	Morecambe - BGC	-	Further development of gas reserves.

/ cont'd

TABLE 11.5 cont'd

Year	Field/Operator	Estimated Development Cost (£m; 1979 prices)	Remarks
1984	S. Beryl - Conoco	-	Further development; probably relatively inexpensive.
	C. Cormorant - Shell	-	Approx. 100m barrels; possible subsea tie-in to S. Cormorant.
	Lomond - Amoco	-	Previously uncommercial gas condensate field; may be developed once gas gathering system in operation.
	Tern - Shell	-	Possible future development of previously marginal oil field.
	206/8 - B.P.	-	Extremely complex, difficult development; waxy oil in shallow but wide reservoirs not deep below the surface; deep water.
	Crawford - Hamilton	-	Possible future development; heavy oil and low porosity will make any development complicated.

SOURCE : Researcher's own estimate based on published information and interview data.

The field development pattern shown in Table 11.5 is based on the following reasoning :-

- (1) The minimum period between the discovery of a significant find and government approval of a development plan is currently in the region of three years, the intervening period being required for appraisal drilling and the preparation, submission

and consideration of the development plan. For example, although BNOC's 30/17b find, discovered in 1978, is being developed with all possible haste, a decision to go ahead is unlikely before the end of 1980 as a 30 month programme of appraisal drilling is required. Thus, any platform orders placed before 1983 will be associated with the development of finds already made.

- (2) In recent years there has been a slump in the number of significant finds made in the U.K. sector of the North Sea. This slump is a combination of a reduction in the level of exploration drilling¹⁸ and a fall in the success rate - in 1978-79 on average only 10% of exploration wells were successful, compared to a 40% success rate in the early 1970s. Moreover, the quantity of oil found per successful well fell from an average of 50 million barrels in the mid-1970s to nearer 25 million barrels in 1978 (Dafter, 1979a). This reduction in the number and size of finds made in the late 1970's has resulted in a dearth of large fields awaiting development in the early 1980s.
- (3) However, the massive increases in the price of crude oil which occurred in 1979 ensured that some of the 50 or so already identified, so-called 'marginal' fields in the U.K. sector will be developed.
- (4) Although developments such as the TLP may, in time, significantly reduce the cost of offshore development, they are unlikely to have a major impact on development costs in general in the period to 1985. The Hutton TLP development, for example, will cost at least £600 million, while any North Sea field of around 250 million barrels is likely to require a large structure and development expenditure of not less than £500 million. However, in particular cases technological advance may result in the exploitation of a previously uncommercial discovery, or at least bring the development of a field forward in time. For example, the Magnus field became viable - having previously been considered marginal - due to the use of subsea completions on seven satellite wells surrounding the central platform. Indeed, the 1980s should see considerable use of underwater completions, both of the

18. See Appendix 3.3.

individual well type and those arranged in clusters from an underwater manifold. In addition, various kinds of floating structures (including tankers) are currently being considered as production facilities in relatively cheap development projects for small fields with short lifespans - for example, a converted drilling rig is being utilised in the Buchan field. Thus, as a result of certain technological developments and, more especially, rising oil prices, several fields (such as Alwyn and Andrew) which were previously considered marginal will be developed during the period to 1985. (As it is impossible to forecast the level of North Sea oil and gas taxation which the government will deem appropriate during the period to 1985, it has been assumed that such changes as may be made to the tax regime will not radically alter the economics of field development).

- (5) Similarly, the decision to increase the price of gas has improved the economics of developing gas fields and development of the Rough, S.E. Indefatigable and Morecambe Bay fields is expected in 1981-82. With the installation of a gas gathering system other fields, such as Bruce, may also become economical.
- (6) In estimating the year in which these oil and gas developments may go ahead and platform orders be placed, the following factors have been taken into consideration:-
 - a. The oil companies prefer an ordered pattern of development, moving steadily from one development project to the next, in this way providing continuity of employment for their experienced development team(s). Thus B.P., for example, can be expected to turn their full attention to the development of one of their marginal fields, probably Andrew, around the time that their Magnus development nears completion in 1982-83.
 - b. The time-schedules incorporated in operators' field development plans often prove over-optimistic. Slippage may occur not only with respect to the construction, installation and commissioning of production facilities, but also earlier at the appraisal and planning stages. For example, there is some doubt whether the British Gas Corporation can meet an extremely tight schedule which calls for orders for several (probably five) steel jackets to be placed in 1981 in order

to achieve production in late 1983.

- c. The government's depletion policy is, as yet, undecided. Production from current North Sea developments is expected to peak around 1985 and fall below the self-sufficiency level of approximately two million b/d around 1988-89 (Brown, 1979). The government's ability to influence the production levels of these fields is extremely limited given the 'Varley assurances' already granted to the oil companies and the danger that cutting production might harm oil reservoirs. An attempt could nevertheless be made to control the flow of oil from new developments either by regulating the pace of offshore exploration through the timing, content and scale of future rounds of exploration licences, or by influencing the timing of development activity through the procedure for granting consent for development proposals submitted by the oil companies. Undue delay of development programmes would, however, be particularly unpopular with oil companies, while any such obvious action aimed at restricting production would also raise objections from our E.E.C. and O.E.C.D. partners, particularly at a time when uncertainties over the continuing supply of Middle East oil have increased. As the present government seems opposed to intervention in the affairs of private industry such action is, in fact, very unlikely, especially since any development currently under consideration would probably not achieve peak production until after 1985. Indeed, several of the 1980-83 developments are 'marginal' fields, development of which the government appears more likely to encourage than impede.

- (7) It is, of course, even more difficult to predict the pattern of developments which may take place from 1983 onwards. Development projects receiving government approval during this period could include several significant finds already made, such as N. Brae, S. Beryl, C. Cormorant, 206/8 etc. Significant finds made during 1980-82, if exploited vigorously, might also receive development approval (and result in platform orders) by 1985. As explained above, the number of significant finds made during the period 1980-82 will depend upon the level of exploration drilling activity

and its success rate. Both of these factors depend to some extent on the scale and content of future licensing rounds. As discussed above, some attempt may be made to control depletion by regulation of offshore licensing and current evidence suggests that the seventh round of licensing could offer a relatively small number of blocks - certainly fewer than the oil industry would like - although nothing is known about the quality of the blocks to be offered. Nevertheless, exploration activity started to pick up in 1979 and this trend is expected to continue in the period to 1980-82. However, there seems little reason to expect that the success rate will radically improve or the amount of oil found per successful well significantly increase during the 1980-82 period. Certainly the general consensus in the oil industry is that the best and most easily identifiable reservoirs have already been discovered and that there is little chance of another Brent or Forties being found. Similarly, the Department of Energy is of the opinion that well over half the total recoverable reserves on the U.K. Continental Shelf have already been discovered. Official estimates put total reserves in the range 2400 - 4400 million tonnes (17500 - 32100 million barrels), of which 1500- 2600 million tonnes (11000 - 19000 million barrels) have already been discovered (Department of Energy, 1979). In Table 11.6 below, which summarises the information provided in Table 11.5, it has therefore been assumed that in 1984 and 1985 new developments will continue to be approved, although the combined budgeted expenditure of the developments going ahead in each of these years - £1 billion - will be lower than that of previous years.

Although equipment orders tend to be concentrated at the start of the development phase - for example, the platform is usually ordered soon after development consent has been granted - capital expenditure is incurred over a number of years. Analysis of the spending profiles of previous field developments in the U.K. sector of the North Sea reveals that :-

- (a) Expenditure is usually incurred over a period of 5 - 12 years depending, for example, on the size of the field - capital expenditure on large fields is generally spread over a longer period.

TABLE 11.6

Summary of U.K. Field Development Activity,
1980 - 85

Year	Summary of Activity (1979 prices)
1980	Three major platforms (including a TLP) to be ordered for three developments costing in total £1.8 billion.
1981	Seven platforms (five of them small) to be ordered for five developments costing in total £1 billion.
1982	Nine or ten platforms (seven of them small) to be ordered for six developments costing £1.15 billion.
1983	Five or six platforms (two or three of them small) to be ordered for five developments costing £1.05 billion.
1984	Developments costing £1 billion.
1985	Developments costing £1 billion.

SOURCE : Table 11.5.

- (b) Capital expenditure tends to peak in the third or fourth year of a field's development.
- (c) The overall spending profile of the U.K. fields upon which development had commenced by December 1979 is shown in Table 11.7.

TABLE 11.7

Spending Profile of Fields upon which Development Commenced 1971-79

Year of Development	1	2	3	4	5	6	7	8	9 - 12
Percentage of Total Capital Expenditure	5	12	22	21	14	10	7	4	5

SOURCE : Interview data.

However, the developments which will get under way in the period 1980-85 will tend to be smaller, 'marginal' developments or field extensions. For this reason the historical spending profile presented in Table 11.7, although a useful guideline, is inappropriate and the spending profile shown in Table 11.8 probably a better estimate.

TABLE 11.8

Spending Profile of Fields upon which Development will Commence 1980-85

Year of Development	1	2	3	4	5	6
Percentage of Capital Expenditure	10	20	25	25	15	5

SOURCE : Researcher's own 'best estimate'.

When the field development expenditure detailed in Table 11.6 is allocated according to the estimated spending profile shown in Table 11.8 and combined with the capital expenditure outstanding on field developments already under way as at December 1979, the estimated capital expenditure on U.K. field developments over the period 1980-85 is as shown in Table 11.9 below.

TABLE 11.9

Estimated Capital Expenditure on U.K. Field Developments, 1980-85

(£m : 1979 prices)

Capital Expenditure	1980	1981	1982	1983	1984	1985
Current Field Developments	1820	1620	1140	590	255	150
New Field Developments	180	460	765	1035	1115	1080
TOTAL	2000	2080	1905	1625	1370	1230

SOURCES : Estimated capital expenditure on current field developments based on data provided by Wood Mackenzie & Co.; estimated capital expenditure on new field developments based on researcher's own 'best estimate'.

In addition to field development activity, North Sea gas collection schemes are currently the subject of studies in both the U.K. and Norway and there appears to be little doubt that such a system will be installed during the period 1980-85. The restriction placed on the output of the Brent field is, for example, an indication of the government's intention to minimise wastage of associated gas. Possible projects range from a straightforward link between St. Fergus and the Beryl field (which appears to have almost enough gas and natural gas liquids to justify a narrow line) to more complex schemes linking unconnected Norwegian fields to the Scottish coast. However, the most likely pipeline project in the U.K. sector is a major pipeline system running parallel to the median line with Norway, collecting gas from as far north as block 211 (NE of Shetland) to blocks 15 and 16 (where the 'T-block' and Brae fields are situated) before coming ashore at the St. Fergus terminal. This project is likely to be completed in several stages costing in total £2 - 3.5 billion, depending upon its scope.

Summary

The evidence presented suggests that several (somewhat smaller) developments will commence annually throughout the period to 1985, providing a steady string of platform orders. Total capital expenditure on field developments will continue at around £2 billion per annum until 1982, but will thereafter fall quite sharply before stabilising at around £1.25 billion per annum for several years from 1985 onwards.

Although operating expenditures will undoubtedly increase over the period 1980-85 as the number of platforms installed in the U.K. sector builds up, most of the demand created will fall on service companies rather than the manufacturers which supply the equipment required at the development phase of activity.

11.5 GLOBAL OFFSHORE MARKETS

11.5.1 Western Europe

TABLE 11.10

Offshore Oil Production in Western Europe (1979)

Country	Barrels per day
Denmark	12,000
Italy	13,297
Norway	367,999
Spain	13,270
U.K.	1,494,460
TOTAL	1,901,026

SOURCE : Unless otherwise stated the statistics shown in Tables 11.10 - 11.16 are based on the country by country survey of world oil fields provided in Oil & Gas Journal, 31.12.79, pp. 79-122.

Norway

The main centres of production are currently the Ekofisk oil and gas complex - which includes the W. Ekofisk, Cod, Tor, Albuskjell, Eldfisk and Edda fields - operated by Phillips, and the Frigg gas field, operated by Petronord. Both complexes are served by established pipeline systems.

Development of the giant Statfjord oil field (operated by Mobil) has suffered considerably from design and construction delays and cost escalation. The final cost of the 'A' platform, now virtually completed, should be in the region of £700 million. The second massive concrete platform, which should be installed in the summer of 1981, will cost in excess of £1 billion. Alternatives for the £1 billion 'C' platform are being considered. All oil production will be transported by tankers loading at single-point mooring buoys, but the transportation of the associated natural gas is still under evaluation.

Production from the Valhall field, which is also currently being developed, will be via the Ekofisk complex.

Although the Norwegian government is likely to continue to support a programme of steady offshore development (to ensure stability in the Norwegian economy) there are a number of projects that could go ahead before 1985. The major development is likely to be the construction of a gas pipeline system costing anything from £2.5 - 7 billion, depending on the scale of the scheme selected. It seems likely that a major north-south line running to Europe will eventually be constructed but, in the meantime, an additional line to the U.K. may be built. The government feel that the discoveries made during the summer of 1979 have increased reserves above the level needed to make such a gas collection system viable. The principal discovery made was that by Norske Shell on Block 31/2, which the Petroleum Directorate has suggested could prove to be the world's largest offshore gas field.

Although the Norske Shell discovery may not be developed before 1985, the small NE Frigg and Odin gas fields probably will be tied into the Frigg complex during this period, while there are other gas discoveries, such as Esso's Sleipner field, also awaiting development. In addition, Statoil, the state oil company, expects either the "Golden block" (34/10) or the "Silver block" (30/6) to be declared commercial in 1980. The Golden block is known to contain a lot of oil and gas held in complicated structures requiring costly development - probably in excess of £1 billion - and is likely to go ahead with all possible speed as it would be the first to be operated by Statoil. While other possible oil developments include Esso's Balder field and further extensions of the Ekofisk complex, B.P. has already submitted plans for the development of the Ula field, a small oil discovery in block 7/12.

As at June 1979 about £5 billion had been invested in exploration (£0.6 billion) and development (£4.4 billion) on the Norwegian Continental Shelf, and in 1978 alone new contracts worth £0.85 billion were placed for the Norwegian sector. Given the list of possible developments detailed above and the policy of the Norwegian government, it seems likely that this level of activity will be maintained in real terms during the period 1980-85, with several small developments

'bridging the gap' between the Statfjord 'B' and Valhall developments (most of the work upon which will be completed by the end of 1981) and the Statfjord 'C', Golden block, 31/2 and other major developments likely to go ahead later in the 1980-85 period.

Norwegian companies were quick to spot the opportunity presented by the offshore market to capitalize on their country's traditional expertise in marine engineering. The initial response by Norwegian industry was characterised by concentration on the supply of a few products and services - including important items such as mobile drilling rigs, concrete production platforms and supply ships - in which they achieved substantial export success. However, strongly supported by the Norwegian government, Norwegian industry has gradually broadened its offshore capability, capturing 60% of the new contracts placed for the Norwegian sector in 1978.

Denmark

Offshore exploration and development is in the hands of the Danske Undergrunds Consortium (D.U.C.), which has made a series of relatively modest - by U.K. and Norwegian standards - offshore oil and gas discoveries, including the Dan field which has been producing small quantities of oil since 1972.

In May 1979 the Danish parliament gave permission for the development of the Tyra and Roar gas fields. The platforms will be small steel structures but in total the development will cost somewhere in the region of £250 - 680 million. The £100 - 120 million development of the Gorm field is also under way. Despite these developments, it is unlikely that Denmark will become a major market for offshore-related equipment given the nature of the oil and gas reservoirs so far discovered.

Eire

In the 1970s around 55 wells were drilled in Irish waters with no better results than non-commercial indications of oil, although one small gas field has been discovered and brought into production at Kinsale Head, off the Cork coast. Attention is currently concentrated

on the Porcupine Trough (off the west coast) where Phillips made the first significant (but non-commercial) oil strike in Irish waters in October 1978 and BP discovered hydrocarbons in 1979. However, eight other wells in this area have produced only traces of oil. Furthermore, the water depths in the Porcupine Trough - 1200-1500 feet - could be a serious deterrent to the development of any discoveries, unless they have very large reserves. Thus, although drilling should continue for several years no development activity is foreseen at the present time.

Licensing terms state that licencees should use Irish goods and services as much as competitively possible. Irish involvement in exploration contracts increased from 16% in 1976 to 26% in 1977, at a time when the Irish government estimated that the maximum share which Irish industry could be expected to win was 29%. Around £60-70 million was spent on exploration in 1978.

Rest of Western Europe

Although many small offshore fields have been identified in Holland's sector of the North Sea, no major discoveries have been made in recent years and while some small offshore gas developments are likely during the 1980s, Holland will not develop into a major offshore market. Holland has, in any case, a well-developed offshore supplies industry with approximately 50 companies specialising in oil industry supplies. Small oil and gas fields have been discovered off the coast of Greece (in the North Aegean Sea) and Greece should be an oil producer on a modest scale by early 1981. The South Kayala gas field is also being developed. Off the coast of Italy a series of hydrocarbon finds was made in 1979 by the ENI group in the Northern Adriatic Basin, already the main source of Italian gas production. Gas has also been discovered further south in the Ionian Sea. Italy has a well-developed engineering industry and U.K. companies are unlikely to make much headway in this small market. Spain discovered oil in 1979 in the Gulf of Cadiz (on the Atlantic Shelf) and in the Mediterranean, where small quantities of oil are already being produced.

11.5.2 North America

TABLE 11.11

Offshore Oil Production in North America - (1979)

Country	Barrels per day
Canada	-
U.S.A.*	1,730,000
TOTAL	1,730,000

* Estimated at 20% of total oil production (Dafter, 1978b)

Canada

Substantial reserves of oil and gas are believed to exist in the Beaufort Sea and the offshore regions of the Arctic Islands and Eastern Canada. To date, however, offshore activity has been constrained by the costs and technological barriers imposed by an extremely hostile environment. In addition, most of the oil and gas deposits lie a considerable distance from the centres of consumption, necessitating difficult and costly transportation.

Dome Petroleum made a series of oil and gas finds in the Beaufort Sea in 1977-79 and hope that the area could be producing oil at around 200,000 b/d by 1985, an achievement which would require investment in production and transportation systems of around \$6 billion. The tremendous pressure created by the formation of pack ice (which can be 7 feet thick in this area) necessitates the construction of some form of artificial drilling island, as a steel platform of the North Sea type would be crushed.

Panarctic Oils has been exploring in the Arctic Islands since 1968 although their first offshore well wasn't sunk until 1974. In 1979

Panarctic discovered a gas field in the Whitefish Straits which should add a further 5 trillion ft^3 to the existing 14 - 15 trillion ft^3 of proven and probable gas reserves (principally on the Melville and King Christian Islands), taking them close to the threshold of 20 - 25 trillion ft^3 thought necessary to make a pipeline to southern markets viable. However, considerable appraisal drilling must be undertaken before the complex and expensive development of these reserves can commence (probably towards 1985).

Finally, off the east coast of Canada the main problems are presented by icebergs and the wind and general sea state, which are at least as demanding as those in the North Sea. This area saw intense exploration in 1979 with 11 wells being drilled (in the Grand Banks off Newfoundland, the Labrador Shelf and in the Davis Strait) at a cost of around \$250 million. Commercial quantities of both oil and gas have been found in the area and development activity could commence before 1985.

Thus, major developments appear likely to get under way from around 1983 onwards. U.S. manufacturers appear well placed to provide specialised equipment beyond the capability of indigenous industry.

U.S.A.

The U.S. Continental Shelf offers considerable potential as an oil-bearing province. In 1978 the American Petroleum Institute estimated that only 5% of the U.S. Continental Shelf had been explored, although offshore areas accounted for around 18 - 20% of U.S. domestic oil supply (Dafter, 1978b).

The majority of offshore activity has been focussed on the shallower areas of the Gulf of Mexico off Louisiana and Eastern Texas - only 12 out of more than 800 structures in the Gulf of Mexico are in depths of more than 100 metres and the majority are in close proximity to shore (Baker et al, 1978). Although production has been declining, the area is still one of the world's largest oil and gas producers and the deeper waters do show considerable promise. There are, however, also two main areas of offshore production on the Pacific Coast of the U.S.A. - the Los Angeles Basin and the Santa Barbara

Channel - and a third in the Cook Inlet, off the south coast of Alaska, where drilling in the mid-1960s identified several major fields which were subsequently rapidly developed.

In December 1979 licenses were awarded for areas in the Beaufort Sea, off the north coast of Alaska. Despite the extremely difficult offshore conditions, very short drilling season and distance from market, these licenses are thought to contain some of the best acreage in the U.S.A. However, even if exploration is successful it could be several years before large-scale development takes place.

Off the east coast exploration in the deep-water zone known as the Baltimore Canyon started in the spring of 1978. The area aroused intense interest due to its proximity to the high energy consuming areas of the east coast and in the summer of 1978 a significant natural gas and condensate find was made, confirming the presence of hydrocarbons in the area. However, by February 1979 more than a dozen other wells had failed to produce another significant find and the extent to which hopes for the area had receded was shown by the paltry bidding for the second round of licenses for the Baltimore Canyon auctioned that month.

The decline in domestic oil and gas reserves in recent years and the decision to allow gas and oil prices to rise to the market rates should provide sufficient incentives for oil companies to step up their exploration and production activities, both on and offshore. The U.S. market for offshore oil and gas equipment will, however, be extremely difficult to penetrate given the considerable experience and expertise of indigenous U.S. manufacturers.

11.5.3 Central America and the West Indies

Offshore conditions in this area are generally favourable, apart from seasonal hurricanes. Most countries in this zone will be largely dependent on imported oil-related technology although the majority traditionally import most of their engineering requirements from the U.S.A. and employ U.S. standards.

TABLE 11.12

Offshore Oil Production in Central America & the West Indies(1979)

Country	Barrels per day
Mexico *	265,000
Trinidad and Tobago	168,358
TOTAL	433,358.

* As at January 1980.

Mexico

Mexico has been motivated by its vast reserves of low-cost oil, its proximity to the U.S. market and its desire to use oil as a 'motor' to increase the speed of economic development to exploit its hydrocarbon resources as quickly as possible. Oil production rose dramatically during the 1970s and the 1980 target of 2.25 million b/d should be achieved. Moreover by 1985 Mexico should be capable of producing 4 million b/d, although production will probably be restricted to around 2.5 million b/d in order to prevent the economy from overheating. Natural gas production is expected to rise from its 1978 level of 2.56 billion cubic feet per day (ft^3/d) to 3.3 billion ft^3/d in 1979, and natural gas production capacity should be around 5 billion ft^3/d by 1982.

Until recently offshore development had been limited to extensions of existing onshore production areas in relatively shallow water in the Gulf of Mexico, together producing only about 40,000 b/d. However, the Cantarell complex of fields in the Gulf of Campeche (in the Gulf of Mexico), which promises to be one of the most prolific offshore provinces in the world, has been rapidly developed since its discovery in 1975, with production rising from 20,000 b/d in June 1979 to 225,000 b/d in January 1980. By December 1980 production should reach 500,000 b/d, the limit of the existing 36" pipeline. A second phase

of development, involving the exploitation of at least 3 more fields in the Cantarell complex currently being delineated, could boost offshore production to at least 1 million b/d by the early 1980s. Offshore areas will, in fact, account for most of the increase in production over the period to 1985 as Mexico's offshore oil is easier and more economical to produce than her onshore oil, while it is currently logical to increase offshore oil production and use the onshore fields for gas production as this minimises gas flaring.

Fiercely nationalistic, Pemex (the State oil company) has been slowly developing its technology since 1938 when the oil industry was nationalised. However, the movement offshore has provided a stiff technological challenge (despite the fact that the fields so far developed are located 40-50 miles offshore in only 115-250 feet of water) and Pemex is being forced to look for outside experience. In addition, Mexico's manufacturing industry can't cope with the level of demand from the oil sector. Last year Pemex bought around \$2 billion worth of equipment of which well over half was imported. Moreover, this situation is unlikely to change significantly until at least 1983, despite high tariff barriers and Pemex's policy of giving a 15% advantage to national or joint-venture companies when it puts out to tender.

At the moment most imports are from the U.S.A. However, Pemex is trying to diversify its purchases away from the U.S.A. and a foothold has been gained in the market place by several Dutch, Norwegian and French companies, usually through some form of joint-venture as Mexican law limits foreign investment to 49% ownership. Despite showing a great deal of interest, U.K. companies have in general been slow to form joint-ventures, nor have orders been placed directly with U.K. companies to any great extent. Apart from an inability to offer competitive terms, it may be that British firms have still to gain the thorough knowledge of the intricate workings of the Mexican system which appears to be necessary to penetrate this market.

Rest of Central America & and the West Indies

Trinidad & Tobago has rapidly developed its sizeable offshore oil and gas resources. Elsewhere prospects are good in the Bahamas, which

lie in close proximity to the large oil fields in the eastern sector of the Gulf of Mexico; on the Gulf coast of Guatemala, near the large oil finds of southern Mexico; and in Barbados, just north of Trinidad & Tobago. Interest is also being shown in the Continental shelves of Jamaica and Cuba. A new platform fabrication and ship-building yard was established in 1979 on the Caribbean island of Aruba in the expectation of securing orders for the Gulf of Mexico and South America.

11.5.4 South America

Offshore conditions, particularly on the Atlantic coast, are generally favourable. The only exception is the southern tip of the continent, where conditions are stormy and inhospitable.

The countries in this area are largely dependent upon imported oil technology. However, a large proportion of manufactured imports comes from the U.S.A., although some Western European countries (such as West Germany) have been fairly successful in the area. Unfortunately, U.K. companies have been relatively unsuccessful in their attempts to break into South American markets in recent years.

TABLE 11.13

Offshore Oil Production in South America (1979)

Country	Barrels per day
Brazil	38,359
Chile	5,695
Peru	27,063
Venezuela*	1,862,394
TOTAL	1,933,511

* Estimate : Oil production from Lake Maracaibo (treated as offshore) accounts for roughly 80% of total Venezuelan oil production.

Argentina

Offshore exploration was limited during the years the State oil company, YPF, held monopoly power. However, with increasing demand and declining offshore production the Government has accepted its dependence on foreign expertise and investment and revised its licensing arrangements to encourage private companies (including Shell) to undertake exploration.

The continental shelf off Southern Argentina is considered promising, particularly the area between Tierra del Fuego and the Falkland Islands where environmental conditions are very similar to those in the North Sea. As yet results have been disappointing but should developments be eventually undertaken U.K. equipment suppliers should be well-placed given the similarity in offshore conditions, Argentina's dependence on foreign technology, the active participation of U.K. oil companies - including BP - in risk contracts in the area and the absence of import duties on equipment required for offshore activities.

Brazil

While demand is rising at around 8% per annum, oil production has fallen steadily as onshore production has declined faster than the growth in production from new offshore areas. Although this situation should be reversed shortly as production builds up from the Enchova and Garoupa fields in the Campos Basin (which are the first of 8-10 prospects in the area to come on stream), Brazil will fall well short of the production target of 425,000 b/d of oil set in the current five year plan. Foreign oil companies have been awarded exploration blocks in the Santos basin (where BP and Exxon are operating) and the Amazon Delta (Shell and a Franco-Italian group). However, until September 1979 when Exxon found oil in the Santos Basin the oil companies had only minor oil traces to show for two years of risk contract drilling. Nor is major development activity anticipated in Brazil's inshore area, where a number of shallow water fields scattered along the coast from north of the Campos Basin as far as the Rio Grande do Norte (which lies at the turn of the coastline) currently produce roughly half of Brazil's offshore oil.

Brazil has a very competitive shipbuilding industry and local construction yards are also being set up with a view to building platforms not only for the Campos Basin but also for other offshore areas in South America. Although Petrobras (the state oil company) had previously strongly defended local manufacturers, restrictions on imported equipment for offshore oil production have supposedly been lifted.

Venezuela

Conventional oil production (about 80% of which comes from Lake Maracaibo) has fallen steadily during the 1970s but has still exceeded the rate at which new discoveries have been made. Thus, one of the first tasks of Petroven (the state oil monopoly) following nationalisation of the oil industry in 1976 was to reactivate exploration (which foreign companies had virtually halted because of the impending state takeover). Consequently Petroven are to spend around \$25 billion on hydrocarbon development over the next 10 - 12 years, with around \$5.1 billion of this being spent on exploration, \$11 billion on conventional production, \$2 billion on the exploitation of the heavy oil in the onshore Orinoco region and the remainder on refining, transportation and storage (International Petroleum Times, 7.7.79).

The most promising offshore area is the Gulf of Venezuela (adjacent to Lake Maracaibo) which has unfortunately been ruled out of bounds to oil exploration due to a border dispute with Columbia. Nevertheless, since a \$175 million, two-year offshore drilling programme was commenced in October 1978, 3 out of 16 wells have struck hydrocarbons. In June 1979 natural gas was discovered north of the Paria Peninsula when a well was drilled into the same giant gas field which begins off Barbados and extends past Trinidad & Tobago into Venezuelan waters. Indeed, although two small oil finds have also been made Petroven believe that offshore discoveries are more likely to be of gas than oil.

The active exploration programme currently being undertaken will probably result in development activity from around 1982 onwards. Preference will, however, be given to domestic manufacturers.

Rest of South America

Chile has found oil and gas in the extremely hostile environment of the Straits of Magellan and offshore oil production began in 1979. Peru also produces offshore oil in small quantities while Ecuador has discovered natural gas offshore.

11.5.5 Africa

The main area of activity is along the west coast, where environmental conditions are generally favourable. Most of the countries in this zone are ex-U.K. or French colonies heavily dependent upon imported technology and expertise. No one market is particularly large but together they comprise an important target for British offshore suppliers.

TABLE 11.14

Offshore Oil Production in Africa (1979)

Country	Barrels per day
Angola/Cabinda	99,699
Cameroon	22,900
Egypt	426,238
Gabon	166,183
Nigeria	406,037
Tunisia	45,300
Zaire	20,840
TOTAL	1,187,197

Egypt

The Egyptian government is attempting to increase oil and gas production as rapidly as possible and new offshore licenses were signed in 1979 in an attempt to boost the already busy offshore programme. Although most of Egypt's oil comes from fields in the shallow Gulf of Suez, the Abu Qir field in the Mediterranean became

Egypt's first producing offshore gas field in January 1979 (with a second gas find being made nearby later in the year). The limited exploration carried out in the Red Sea has so far failed to produce a significant find.

Nigeria

Each year more oil is being found in Nigeria than is being extracted. There are also substantial fields of non-associated gas which have been located and sealed until the Bonny LNG plant is ready. Onshore fields provide the majority of Nigeria's reserves and production but a series of sizeable fields do lie offshore in the Gulf of Guinea and the new offshore acreage which has recently been offered for exploration is expected to produce new finds.

Rest of Africa

On the Atlantic coast Gabon, Cameroon, Zaire and Cabinda/Angola are all producing oil from offshore fields, while gas has been discovered off the coasts of Ghana, Gabon, Cameroon and Namibia/South Africa. Exploration is also being undertaken off the east coast of Africa, while in the Mediterranean Tunisia has made small offshore oil and gas discoveries and is producing oil from the Gulf of Gabes. Texaco are to develop three fields off the coast of Angola and Agip and Elf are developing three fields offshore the Congo Republic.

11.5.6 Middle East

All the offshore fields discussed in this section lie in the Persian Gulf where conditions are very favourable to offshore development. Water depths tend to be less than 50 metres and nowhere exceeds 200 metres, while offshore structures are unlikely to be faced with waves of more than 10 metres in height (compared with the freak waves of 40 metres which are possible in the North Sea). The technological demands are thus less harrowing than those in the North Sea and the offshore structures in use are relatively small and simple in design.

There are already fabrication yards at Dubai and elsewhere in the region that can look after most of the required construction, although in

other sectors the Persian Gulf states are still relatively under-developed in terms of providing an indigenous supply of equipment and services.

TABLE 11.15
Offshore Oil Production in the Middle East
(1979)

Country	Barrels per day
Abu Dhabi	585,818
Dubai	362,734
Iran	175,973
Israel*	40,000
Neutral Zone	413,000
Qatar	250,000
Saudi Arabia (& Bahrain)	2,828,000
Sharjah	12,082
TOTAL	4,667,607

* including the Israeli-occupied portion of the Gulf of Suez.

Abu Dhabi

Although the government is limiting oil production to a level which will prolong the life of the major fields and maximise the recovery of all hydrocarbons (including the country's vast quantities of natural gas) it is nevertheless investing heavily in building up its basic production capacity. By far the most important development is the exploitation of the giant Upper Zakum oilfield - for which Compagnie Francaise des Petroles (CFP) are project managers - which was started in 1977 and will cost around \$4 billion. Oil production is expected to commence in 1981 with full capacity of 500,000 b/d being reached in 1986, although a later stage of development could increase capacity to 800,000 b/d. A number of smaller offshore

developments are also underway, costing in total over \$1 million.

The results of recent exploration suggest that there are rich reserves still to be discovered. For example, a recently discovered offshore gas field could ultimately prove to be one of the world's largest discoveries. However, given the heavy investment already being undertaken in the oil sector early development of this field is unlikely.

Although it has taken over all the top-level policy-making matters, Abu Dhabi still relies heavily on Western (particularly French) oil companies and contractors for most aspects of day-to-day operations. Consequently, although there are opportunities for U.K. manufacturers in this area the presence of French operators and project managers appears to have largely benefitted French suppliers.

Qatar

Offshore fields already account for the majority of Qatar's oil production and other 'marginal' offshore oil fields are known to exist. In addition, while a project designed to collect and transmit associated gas from the offshore oil fields to the mainland is currently being undertaken, Qatar also possesses considerable reserves of non-associated gas, including the recently discovered (and apparently extremely large) North-west Dome offshore gas field. U.K. firms are well-established in this market.

Iran

The Iranian sector of the Persian Gulf is generally considered to be one of the world's most promising offshore areas, but the revolution drastically reduced the number of foreign technicians in the Iranian oil and gas industry and this has been reflected not only in falling production levels (both on and offshore) but also in reduced exploration and development.

Saudi Arabia

More than a dozen offshore discoveries are managed by Aramco (the

state-controlled oil company) and new offshore fields continue to be discovered. However, Saudi Arabia's currently installed production capacity exceeds its target production level and consequently there is no desire to rapidly develop offshore discoveries. Aramco arranges some of its purchases through branch offices in the Hague and Houston, but most of its buying is handled through its purchasing headquarters in Dhahran. *

Rest of the Middle East

Although further exploration is being carried out in Dubai, it is some time since any new oil finds were made and it is thought that the most likely sources have already been covered. Bahrain's only offshore production comes from the Abu Safah oil field which it shares with Saudi Arabia and although much of its offshore area has been leased no other oil and gas finds have been made and prospects of future discoveries are slight.

11.5.7 South-East Asia

In South-East Asia the waters are generally shallow and except in the monsoon season no extreme conditions are met.

Singapore is a well-established port and the centre for offshore activities in South-East Asia. Five yards have been established to build drilling rigs and local shipbuilding companies are able to build and repair supply boats. Japan is also well placed to become increasingly involved in the offshore equipment market.

Japan

Intensive exploration both on and offshore has so far met with very limited success. Nevertheless, the Japanese government has drawn up a five-year offshore development programme (commencing in 1980) which involves an average of 15 exploration wells per year. Moreover, Japanese companies are involved in a number of joint exploration and development ventures in many overseas areas, including the Gulf of Bohai, China; Palawan Island, Phillipines; the Gulf of Alaska; and offshore Abu Dhabi.

TABLE 11.16

Offshore Oil Production in South-East Asia (1979)

Country	Barrels per day
Australia	386,532
Brunei	216,398
India*	100,000
Indonesia	544,386
Japan	1,761
Malaysia	271,033
New Zealand	2,938
Phillipines*	40,000
TOTAL	1,563,048

* As at December 1979.

Australia

Australia's offshore production currently comes from four fields in the Gippsland Basin in the wide, shallow Bass Straits, where the Tuna oil and gas field is currently being developed and the Snapper gas field should be developed in the early 1980s (at a cost of around £100 million). This area also contains the Marlin, Sunfish and Flounder finds (which should now be developed following the rise in oil prices) and the more recently discovered Bream, Golden Beach and Turrum finds (which are currently being assessed).

Australia's other main offshore area is the North-West Shelf. The Canning Basin, which is estimated to have reserves of around 18 trillion cubic feet of natural gas, contains the North Rankin, Goodwyn and Angel fields. Development of these reserves, which lie about 80 miles offshore in around 415 feet of water, should take place over the period 1980-84 and will involve expenditure of around £1.4 - 1.7 billion on production platforms, pipelines, treatment plants and LNG carriers.

The Exmouth Plateau is regarded by many as Australia's last hope for a major oil discovery. This region lies in deep water (of around 300-3000 metres) 15-18 miles offshore, close to the NW shelf natural gas discoveries. To be commercial any find would need to be of oil and of considerable size as the oil companies are operating at the extremes of drilling technology and beyond known oil production technology. However, the first four (very expensive) wells drilled on the Exmouth Plateau showed only gas traces. Nevertheless, Australia should continue to develop into a major offshore market although it will, no doubt, be heavily protected against imported manufactured goods.

Indonesia

Three main groups of offshore oil fields lie off the coasts of East Kalimantan (formerly Borneo), Sumatra and Java. Exploration and development was held up for a time as the government attempted to renegotiate contracts given to the oil companies operating in the area. However, there appears to have been a 'softening' in political attitudes and exploration expenditure is expected to reach a record level of over \$600 million in 1980. Although the oil industry expects most of the oil fields still to be discovered to be relatively small, significant development activity (especially in relation to offshore gas) is anticipated in the period 1980-85.

Rest of South-East Asia

Malaysia's oil production comes from two groups of oilfields, one off the north-west coasts of Sarawak and Sabah, where Shell are continuing to undertake considerable development work, and the other off the east coast of the Malaysian peninsula, where Exxon are also undertaking further development. The Phillipines became an oil producer for the first time in 1979 when the South Nido field (off Palawan Island) came on stream. The government is increasing its exploration effort and 30 wells should be drilled in 1980. Unfortunately prospects for U.K. companies are poor due to the entrenched position of U.S. companies in this area. Brunei is already producing oil and gas from offshore fields, and another find - the Fulmar Field - was made in 1979 in this small but productive area. Oil has been

discovered in significant quantities off the coast of Portuguese Timor where the prospects for further discoveries are considered extremely promising. Several oil and gas discoveries have also been made in the Gulf of Papua. Bangladesh has discovered nine offshore gas fields but it is yet to find oil. An \$800 million LNG project is currently under consideration and U.K. companies are well-placed to win a major share of equipment orders. Off the coast of Thailand a pipeline is to be build to serve two commercial gas finds made in the Gulf of Thailand but British Gas has so far failed in its attempts to get involved in the area. Drilling is now under way on the continental shelf between South Korea and Japan where oil-bearing stata are known to exist, while offshore exploration has also been revived off the coast of Vietnam, following the conclusion of contracts with Bow Valley (Canada), Agip (Italy) and Deminex (West Germany). Off the west coast of India development work is continuing on the Bombay High and North Bassein fields, while the Ratnagiri oilfield is also to be developed.

11.5.8 U.S.S.R.

Although the U.S.S.R. has vast reserves of oil and gas, traditional fields in the accessible Urals/Volga region are being exhausted and additional reserves will have to be sought and developed further east in Siberia and in offshore areas. The rate of growth of the U.S.S.R.'s oil output has also been declining and it is unlikely that the oil production target of 12.4 million b/d in 1980 set in the current five-year plan will be achieved.

In 1979 offshore production, mainly from very shallow water in the Caspian Sea, was around 200,000 b/d (compared to total oil production of 11.7 million b/d). However, offshore exploration is expected to be an important feature of the next five-year plan, with deeper drilling in the Caspian Sea dominating the picture. Further activity is also likely off Sakhalin Island, especially off its north-eastern coast in the Okhotsk Sea, which Soviet geologists regard as being comparable in hydrocarbon potential with the Gulf of Mexico. A Soviet-Japanese consortium has already had some success in this area, with three out of five wells sunk in 1977-78 striking oil and gas deposits. Further

exploration will also be carried out in the Black and Baltic Seas, although previous exploration in these areas met with disappointing results. Finally, the first exploration to be carried out in the U.S.S.R.'s Arctic waters will probably commence in the early 1980s.

Offshore oil and gas technology in the U.S.S.R. lags markedly behind that available in the West and existing Soviet technology cannot cope with surveying and extracting oil and gas from deep water. The U.S.S.R. will therefore require a wide variety of Western technology to support its offshore programme - in fact, one report has stated that the Comecon market for offshore equipment could be worth \$24 billion over the period 1975-85, with approximately 37% (or \$8.8 billion) being spent on imports (Research Associates, 1978). The technology required will include large diameter pipeline and associated equipment, drilling tackle and drillpipe, subsea engineering equipment and production and extraction equipment.

Some U.K. companies have been pursuing these opportunities for some time. However, there is strong competition for business in the U.S.S.R. and considerable sales effort has been expended by Dutch, French, German, Norwegian, Japanese and U.S. companies.

11.5.9 China

Offshore production is currently restricted to the Gulf of Bohai (in N.E. China) in shallow water of up to approximately 50 metres in depth. This area has been in production for some years, and although development work has been largely confined to the north of the Gulf there are thought to be up to 12 clusters of small steel platforms in existence up to 100 miles offshore.

China has designated offshore oil exploration a priority sector and current policy seems to rest on the premise that the large-scale development of offshore oil production cannot be rapidly achieved without much greater use of foreign technical expertise. Thus a series of eight contracts have been signed with major oil companies to participate in seismic tests for offshore oil. BP and Elf Aquitaine have signed contracts for the Yellow Sea while in the

blocks in the South China Sea near the Pearl River the agreements are with Exxon, Mobil, Caltex and Phillips. Atlantic Richfield is operating to the south and Amoco to the west of Hainan Island. These companies are expected to hand over the seismic data and their interpretation of the findings (free of charge) during 1980 and the oil companies believe exploratory drilling might begin by early 1981.

However, the possibility of long delays is highlighted by the Japanese experience in the Gulf of Bohai. Having reached an initial agreement with the Chinese to appraise and develop a shallow-water area in the south of the Gulf believed to hold a 3 billion barrel oilfield, further negotiations ran into deadlock. Initial worries about the contract - which involves Japan giving China a £1 billion credit to be repaid in oil - were apparently related to Japan's ability to provide a total contracting package given her limited offshore experience, but the main disagreements arose over the financing of the venture and the interest rates on Japanese loans. (Indeed, the financing of offshore-related contracts placed overseas is liable to be of major importance to the Chinese given their limited foreign exchange).

Between October 1976 and December 1978 the Chinese spent about \$550 million on imported oil technology to develop their oil and gas reserves, including at least three survey vessels, six jack-up drilling rigs, six helicopters and six supply vessels. (These purchases have been mainly from Norway, Japan, U.S.A., Singapore and France). The Chinese are also reportedly keen to develop joint-ventures and other forms of co-operation with foreign firms. Despite this, continued maximum use of local industrial resources will be a major policy objective.

Currently China is interested in shallow-water technology. However by 1985 the development of hydrocarbon reserves lying in deeper water may be under way and it is here that U.K. companies may well come into their own, especially since the Chinese authorities are known to have been impressed by the scale and speed of North Sea developments.

11.6 CONCLUSION

The evidence presented in this chapter suggests that the demand for oil will grow at approximately 1% per annum 1980-85. During this period the proportion of oil and gas produced from offshore areas will also gradually increase. As a result of this increased level of offshore activity and the development of more difficult and expensive fields, offshore expenditure worldwide will increase from around £6 billion in 1979 to at least £10 billion in 1985.¹⁹ Although offshore development activity will take place in many parts of the world, the main areas of offshore development in the period 1980-85 will be Norway, North America, Mexico, West Africa, South-East Asia and Australia.

Although a number of smaller fields in the U.K. sector of the North Sea will continue to be developed, it is anticipated that capital expenditure on field developments will fall in real terms by around 25% over the period to 1985. As most expenditure on offshore-related equipment is associated with new offshore developments, this decline in development activity will result in a fall in the domestic demand for many items of offshore-related equipment.

Thus, while the U.K. market for offshore-related equipment will decline 1980-85, the global offshore market will expand.

19. At constant 1979 prices.

CHAPTER TWELVE

EXPECTED FUTURE TRENDS IN THE SCOTTISH MANUFACTURING SECTOR OF THE OFFSHORE SUPPLIES INDUSTRY

12.1 INTRODUCTION

The main objective of the final phase of the fieldwork was to investigate future trends in the Scottish manufacturing sector of the offshore supplies industry by determining the expected response of the sample to a given scenario (developed by the researcher) of the global offshore marketing situation in the period 1980-85. It is evident from the previous chapter that the scenario presented to these firms highlighted the fact that while the U.K. market for offshore-related equipment in general would decline quite sharply over the period 1982-85, the global offshore market was expected to expand steadily throughout the period to 1985. It was argued in Chapter 5 that given this market situation the most appropriate strategy would appear to be the development of offshore markets overseas. For this reason, during the second round of interviews attention was focussed on the strategy of market development. Thus, section 12.3 presents an analysis of the expected strategic response of the sample¹ to the hypothetical, but reasonable, scenario that there will be a decline in the domestic market for offshore-related equipment in general over the period to 1985, during which time the global market will continue to expand.

Reference will also be made - in section 12.3.1 - to evidence concerning these firms' original projections of the trend in their offshore-related exporting activities over the period to 1985², based on their own view of the likely demand for their offshore-related equipment in both the domestic and export markets. It will be shown that the majority of the sample agreed that while the absolute size of the global market for offshore-related equipment would continue to grow (1980-85) the capital expenditure on U.K. field developments would fall over the same period, and that many of these accepted that this would lead to

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1. At the time when the final round of interviewing was undertaken one of the firms surveyed, unit C, was in the process of being taken over by another company. As a result, this section is based on the information collected during the course of interviews in only 39 firms.
 2. This evidence results from the statistical questionnaire completed during the first phase of interviewing.

a fall in demand for their products in the domestic market. However, some firms (including, for example, certain down-hole tool manufacturers) argued quite correctly that the demand for their products was not closely associated with the number and size of field developments, and that therefore the domestic demand for their products might be maintained in the period to 1985 irrespective of the decline in development expenditure in the U.K. sector.

In Chapter 4 it was suggested that there might be a close association between a firm's investment in exporting activity and its export performance. However, it was further argued that this investment may not be undertaken unless the firm's management adopts a positive attitude to exporting, planning the exporting campaign and budgeting for the necessary investment, rather than simply filling any export orders which happen to be received. That is, a firm is likely to be more effective in export markets if its management prepares a plan outlining the export marketing policy to be utilised in the development of overseas markets and budgeting for the investment likely to be required for the successful implementation of this approach. In this respect it is interesting to consider the planning activities of the firms surveyed, information concerning which was collected during the final phase of the fieldwork.

Long-range corporate plans (which typically cover a period of 5 or more years) are of a strategic nature, that is, they are primarily designed to determine corporate objectives and identify appropriate courses of action which may be adopted in order to achieve these objectives. These plans are normally, therefore, of a fairly general nature, simply indicating the form of the product or market development (or other strategy) to be undertaken, although in some cases these plans may be more detailed with planned turnover, profits, investment etc. being expressed in financial terms. In addition, these long-term plans may provide the basis for shorter-term, operational plans which are usually prepared in some detail (for a 12-18 month period) with precise levels being set for raw material, labour and capital requirements and targets established for sales (against which performance can in due course be measured). Formal planning ensures that decisions are made explicit and also - since it forces firms to take some view of the future - increases the likelihood that threats

and opportunities arising out of change in the market-place are identified (Bates & Parkinson, 1969; Dale, 1973; Argenti, 1968).

Thus, a company should plan for the future. However, any form of planning involves making some assumptions about the economic outlook. Bates & Parkinson argue that reluctance to forecast often stems from the belief that economic events are unpredictable and that therefore forecasting is pointless as forecasts are bound to be wrong. However, the importance of forecasting stems from its ability, if successful, to reduce the area of uncertainty surrounding management decision-making. If, on average, formal forecasts prove to be more accurate than hunches or guesses then forecasting will provide better information on which to base management decisions and will therefore result in improved decision-making (Bates & Parkinson, 1969; Drucker, 1968; Spencer, 1968).

Although a number of factors (such as the technical complexity and diversity of a firm's products) will influence the need for planning, Bates & Parkinson argue that a key variable influencing the extent and nature of planning and forecasting activity will be the size of the firm :

"In a small company planning can be carried on without any great apparatus. In a one-man business there is no great need to commit much information to paper. But for the larger business a formal plan is indispensable."
(Bates & Parkinson, p.266).

Thus, in the case of a small firm, strategic plans may consist of no more than a few ideas in the owner-manager's head, based on a subconscious forecast of the future market situation. However, the limited extent of formal planning being undertaken in a small firm may also be the result of essential strategic decision-making being obscured by a myriad of operational problems which act as immediate demands on manager time and effort. In this way, Ansoff (1968) argues, unless specific provision is made for concern with strategy, effort may continue to be directed at improving operating efficiency at a time when attention to strategic opportunities may produce a more radical improvement in the firm's performance. For example, unless small, offshore-related manufacturers find time to formalise their planning activities they may continue to be so weighed down by

day-to-day problems that they fail to recognise the opportunities available to them in overseas markets through the strategy of market development and, as a result, may continue to reinvest in activities in the domestic market earning a lower return than those available in the export market. Moreover, as mentioned above, even if the opportunities presented by market development are recognised and the firm intends to export, its success in this activity may heavily depend upon the commitment of adequate resources, something which might not take place unless the export marketing programme has been planned and an appropriate budget set. Thus, the data collected in the final phase of the fieldwork will now be analysed in order to discover whether there was any evidence of an association between the formalisation of planning, the commitment of resources to exporting and export performance.

12.2 THE PREVALENCE AND IMPORTANCE OF FORECASTING AND PLANNING ACTIVITY

Altogether 29 of the 39 firms surveyed claimed to have formulated a definite policy with respect to their offshore-related manufacturing business. In four cases this strategy was based on an annual plan, and in two cases on a plan with a 3-year time-horizon³ used in association with an annual plan upon which operating budgets were set. However, by far the most common planning structure (used by 23 firms) was a 5-year corporate plan used in tandem with an annual operating plan or budget statement.

Nevertheless, there were considerable differences in the nature of these 5-year corporate plans with, in general, the long-term plans developed by the U.S. multinationals (at their headquarters in the U.S.A.) being rather more comprehensive documents than those used by British companies. Some idea of the detailed nature of the long-range plans devised by the U.S. multinationals was provided by the following statement by the general manager of a U.S. down-hole tool manufacturer :

3. This being the time-span considered by these firms to be necessary for the evaluation of investment decisions.

"Our 5-year, long-range plan used for corporate strategy forecasts all the ratios, exchange-rate ratios etc. and has a complete profit and loss and balance sheet from year to year for 5 years with increases in inflation rates, price increases and exchange rate developments and so on."

This company's corporate plans and forecasts were based on computer analysis and economic modelling of the factors influencing world demand for its products.⁴ This particular U.S. multinational had also devised a very long-range plan of the organisation to the turn of the century.

Some of the respondents from companies utilising planning and forecasting systems were, however, far from convinced of their usefulness. For example, even though he was very heavily involved in the development of corporate plans, the managing director of one British shipyard remarked :

"Although it at least concentrates the mind, the effort expended is disproportionate to the benefits. We're lucky if anything more than the next 18 months ahead has any hard basis at all. After that we just take a notional mix of the type of ship we're capable of building."

Moreover, there was evidence that individuals not involved in the planning process were even less assured of the relevance of corporate planning. The marketing manager of the offshore-related division of one large U.K. company was particularly scathing in his comments concerning the usefulness of the plans devised by head office staff :

"We have marvellous young lads who paint rosy stories. They are always optimistic, I think they talk to the wrong people."

Nevertheless, although several respondents criticised either the cost-effectiveness or accuracy of corporate plans, the majority argued that although forecasting and planning was difficult it was, however, very important, a typical comment being the following :

"Forecasting is essential. If we don't plan ahead we're neglecting our responsibility to manage the business. It's just too easy to say, 'it's too difficult'."

4. As were the corporate planning and forecasting systems of several other U.S. multinationals.

Although a few firms commented on the importance of forecasts and long-term plans in relation to the setting of budgets and determination of the costing structure, the major function of forecasting and corporate planning was generally considered to be the provision of suitable information to allow the identification and assessment of major changes in the market-place (and the threats and opportunities thus created), the selection of appropriate strategic alternatives and the timely appraisal of the resulting investment decisions.

Altogether ten firms undertook no formal planning whatsoever. Typical of the comments passed were "I can't prepare a plan of what we're going to do from day-to-day" and "I don't know what we'll be doing next week at the moment," these remarks coming from the managing directors of two small, Scottish companies. Indeed, 7 of the 16 Scottish firms undertook no formal planning, compared with only 3 of the other 23 firms, indicating that native Scottish companies were less inclined to undertake formal planning than were other firms.⁵

However, it has already been shown that the majority of the Scottish companies were small and hence it was possible that planning behaviour was more strongly associated with size than nationality of firm. Preliminary analysis revealed that although 6 of the 10 non-planning organisations were small, the relationship between size of unit and formal planning activity was not very strong. However, this is perhaps hardly surprising given that (as was pointed out above) all the U.S. and U.K. organisations have formal corporate plans⁶ irrespective of the size of their Scottish subsidiaries. That is, as far as an analysis of planning activity is concerned, the size of the entire group would appear to be a more relevant variable than the size of the Scottish unit. Further analysis revealed that all the foreign and joint-venture units, all but one of the U.K. subsidiaries and 9 of the 16 Scottish units were either medium or large units themselves or were part of larger groups, and that only 4 of these 31 organisations did not undertake formal planning, compared with 6

5. It should be noted that the remaining 'non-planners' consisted of two joint-ventures and a subsidiary of a European company, and that therefore all the wholly-owned subsidiaries of the U.S. and U.K. companies were governed by formal plans.

6. Devised by staff located at the groups' headquarters.

of the remaining small independent companies (as shown in Table 12.1).

TABLE 12.1
Forecasting and Planning Activity by Size of Organisation⁷

Does the Organisation Undertake Formal Corporate Planning?	Size of Organisation		Total
	Small	Medium/Large ⁸	
YES	2	27	29
NO	6	4	10
TOTAL	8	31	39

SOURCE : Interview data

Hence there was a clear association between size of organisation and the prevalence of formal planning activity.

Although there was no relationship in general between the nature of the product and planning activity, there was some evidence that several of the fabricators in particular were finding it impossible to plan ahead simply because the sudden collapse of the fabrication market had necessitated that they turn their full attention to the problem of survival, a typical comment being :

"The thing of prime importance is the next week, at the moment, it's a case of 'let's get what's going'."

The management of another newly-established (but more successful) Scottish fabricator had been too heavily immersed in solving the problems associated with rapid growth to develop a formal strategy :

"This is especially difficult for us ... it's grown so fast. I think the company is more concerned with ironing out its problems of fast growth. We haven't looked as far ahead as we should have done, at the moment we're not looking for more than 2-3 months ahead."

7. Where the unit surveyed was an independent company this is the 'organisation' referred to, otherwise this term relates to the larger organisation of which the unit surveyed was merely part.

8. Over 150 employees.

Thus, there was evidence to suggest that in some firms strategic planning was considered to be less important (or, at least, less essential) than solving more pressing day-to-day problems, with the result that it was often ignored by management.

Comments such as "our management is new to the game, we've done well but we're basically planning from month to month" suggested that there might be a relationship between experience in the offshore market and the nature of planning activity undertaken, in that inexperienced firms might find it harder to forecast developments and hence encounter difficulty in preparing formal, long-term plans. However, although firms without any prior offshore-related experience (whether at the unit or group level) tended to be less likely to undertake formal planning, in general the association was not strong. Moreover, the firms commenting on the particular difficulties of forecasting and planning in what was generally regarded as being an especially volatile market included both experienced and inexperienced firms. For example, it was for this reason that a joint-venture (involving a partner with many years of offshore-related experience) had decided to abandon long-term planning :

"We used to plan in the early 1970's. We no longer plan, we simply sound out the market. We look ahead 18 months in the North Sea, that's as long as you can reasonably forecast with some certainty."

Finally, in general there was no association between the degree to which a firm was involved in the offshore-related market and the nature of the planning activity undertaken,⁹ although the following comment by a firm dependent upon the offshore market for less than one-third of its total turnover was interesting :

"Forward planning hasn't been considered because we've always known there's a demand for our products onshore."

Thus, the key variable influencing the nature of the planning activity undertaken was found to be size of organisation,¹⁰ with small firms in general being less likely to prepare formal forecasts and plans than

9. It may be that there is an association between the nature of the planning process and the offshore-related involvement of the group as a whole but data permitting this analysis was not collected.

10. As defined in Table 12.1 above.

larger organisations. Small firms were less likely to be able to afford specialist staff to undertake the planning function, with the result that planning became just one of the several tasks carried out by the chief executive(s). Consequently some of these individuals were so involved in solving operational problems that they found it difficult to allocate time to the consideration of strategic issues.

It was suggested above that the necessary investment in exporting might only be undertaken if this commitment was embodied in a formal plan. That is, it was necessary to investigate whether firms which had not formalised their planning had failed to commit sufficient resources to exporting and, as a result, achieved only a poor level of export performance. In fact, it was found that firms which undertook formal planning were more likely to export offshore-related equipment than firms which did not - 21 out of 29 'planners' had exported such equipment compared with only 3 out of 10 'non-planners'. Also, it was interesting to note that the 'non-planners' which had exported offshore-related equipment had done so only on a very limited scale (each exporting equipment worth between £40,000 and £150,000 in the year for which data was provided), with exports remaining a fairly small proportion (between 3 and 25%) of their total offshore-related turnover. Furthermore, these 'non-planners' were, in fact, the three firms which had only achieved offshore-related exports indirectly through multinational offshore supply companies located in Aberdeen¹¹ and included two of only three exporters which had undertaken no export promotion activity whatsoever. Thus, this evidence suggests that there was an association between the formalisation of planning, the commitment of resources to exporting and export performance.

12.3 CORPORATE STRATEGY 1980-85

12.3.1 Introduction

This section provides an analysis of the expected strategic response of the firms surveyed to a scenario suggesting that over the period

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11. This being the method of export distribution which minimised the requirement for marketing skills, knowledge of overseas markets and resource commitment by these offshore-related manufacturers as, under this arrangement, it was the multinational offshore supply companies which provided the market knowledge and undertook all the exporting activities.

1980-85 there would be a general increase in global offshore expenditure but a decline in field development expenditure in the U.K. sector of the North Sea. It has previously been argued that this decline in field development expenditure could be expected to result in a fall in demand for offshore-related equipment in general. However, it should be noted at this point that this is a somewhat simplified picture. Indeed, although there is a fairly close link between the level of field development expenditure and the demand for platforms, fabrications and platform equipment (such as process and power plant, communications and wellhead equipment), several of the companies surveyed were manufacturing items of equipment for which the demand is fairly unrelated to the level of field development expenditure. For example, as will be explained in more detail below, down-hole tools and certain items of subsea electronic equipment (such as the camera equipment used for underwater inspection) are required at the production phase of activity and hence the domestic demand for these products may be maintained for some considerable time. Similarly, the demand for ball valves, pipe and pipe-coating facilities is closely associated with the installation of new pipelines, and thus these sectors are likely to be given a boost by the development of the U.K. offshore gas gathering system. For this reason, during the second round of interviews with the group of firms for which the decline in field development expenditure was not particularly relevant, it was hypothesised that the domestic demand for these companies' products would be roughly maintained over the period to 1985, while the global market would continue to expand.

Hence it is not surprising that some of the firms surveyed did not expect the domestic market for their offshore-related equipment to decline. The trend in the volume of domestic demand (over the period to 1985) anticipated by the sample at the time of the first survey (that is, summer 1979) is summarised in Table 12.2 (below). Only four firms expected the domestic market for their equipment to improve in the period to 1985, namely the three platform fabricators and a shipbuilder. It should, however, be noted that these opinions were expressed at a time when there had been a considerable lull in orders for platforms and supply vessels, and that therefore the prevailing attitude was one of 'things can only get better'.¹² Apart from these

12. Moreover, by the time the second round of interviewing was undertaken (February-April 1980) one of the platform yards had altered its opinion concerning future prospects in the domestic market (and was closing down).

TABLE 12.2
Trend in Domestic Demand Projected by Sample

Projected Trend in Domestic Demand ¹³ 1980-1985	Number of Firms
Increased demand	4
Stable demand	21
Reduced demand	14
TOTAL	39

SOURCE : Interview data

cases, there was a considerable degree of agreement between the sample's views concerning likely future market trends and the scenario presented by the researcher. For example, of the 20 fabricators, process, power and wellhead equipment manufacturers identified above as producers of equipment for which the demand was likely to be closely associated with the level of field development expenditure, 11 stated that the domestic market for their products would decline while the rest hoped that it would be maintained - none expected the domestic market to expand. Similarly, of the 14 manufacturers of electronic and oilfield equipment, ball valves, pipe and pipe-coatings - the demand for which is less closely linked to the volume of field development activity - 11 estimated that domestic demand would remain roughly stable (while the others anticipated a fall in demand).

The change in the proportion of offshore-related turnover exported which the surveyed firms anticipated, given their own views of future market trends for their products, is summarised in Table 12.3 below. Altogether 16 firms expected to improve their offshore-related export performance over the period to 1985, while only one firm expected its export involvement to fall (to nothing, following a conscious decision to withdraw from exporting). Table 12.4 (below) summarises the change

13. In real terms.

TABLE 12.3

Trend in Offshore-related Exporting Performance Projected by Sample

Anticipated Change in Proportion of Offshore-related Turnover Exported, 1980-1985	Number of Firms
Significant increase	10
Slight increase	6
No change	22
Slight decrease	0
Significant decrease	1
TOTAL	39

SOURCE : Interview data

TABLE 12.4

Trend in Offshore-related Exporting Performance
Anticipated in Response to Scenario

Anticipated Change in Proportion of Offshore-related Turnover Exported, 1980-1985	Number of Firms
Significant increase	13
Slight increase	4
No change	20
Slight decrease	1
Significant decrease	1
TOTAL	39

SOURCE : Interview data

in offshore-related export performance that the sample would anticipate if the market situation outlined in the scenario were to occur.¹⁴ Given the degree of consensus between the scenario and the sample's own view of future market trends it is perhaps not surprising to find that only five firms altered their estimates of the trend of their offshore-related export performance in the period to 1985. Moreover, in only one of these cases was the alteration in the estimated export performance due to the consideration of a scenario significantly different to the company's own view of market trends, as in the other cases the companies' expectations had, in the period between the two rounds of interviewing, moved more into line with the author's own scenario.

Thus, of the 39 firms surveyed, 17 expected their offshore-related export performance to improve while only 2 anticipated a decline in the proportion of their offshore-related turnover that would result from exports.

In sections 12.3.2 - 12.3.6 the expected strategic response of the sample to the global market scenario is analysed by sector, and in the conclusion (section 12.3.7) an attempt is made to estimate the real growth in total sales and exports of offshore-related equipment which will result from the implementation of these strategies over the period to 1985. Given that several of the surveyed firms did not even forecast turnover 12 months in advance, some of the estimates of these variables in 1985 must be expected to contain a considerable margin of error.

12.3.2 Shipbuilding & Marine Engineering; Concrete & Steel Platforms; Steel, Pipe & Pipe-coating.

Although the larger of the shipyards had previously built an offshore-related vessel for an overseas customer, neither shipyard had completed an offshore-related export contract in the period for which data was collected, primarily due to their failure to meet international price competition from yards in, for example, Brazil, Singapore, Japan and Norway.

14. As discussed during the final phase of the fieldwork.

The smaller yard was continuing to tender for export contracts (and was, in particular, carefully watching offshore developments in the Arctic Circle where the high design content of the required vessels would perhaps give the U.K. yard a chance to compete) but was not at all optimistic about its chances. The scope for offshore-related product development at this yard also appeared extremely limited :

"Modules are not in our league, we would have to bulldoze the yard and start again. The experience of Burntisland Engineers is not a happy one - to convert a shipyard is a mistake, you should start from scratch."

Thus, very little offshore work had been incorporated into this yard's original corporate plan. Unfortunately, this plan had been heavily dependent upon public expenditure - naval vessels, sludge disposal ships, etc - and the decline in this sector had resulted in the corporate plan being reconsidered and a decision being taken (almost in desperation) to try to increase its share of orders for the U.K. offshore market, although its managing director admitted :

"Bearing in mind the complete blank in orders over the last 3-4 years we can't be optimistic."

Nevertheless, full capacity was being forecast although it was conceded that "whether we can achieve this is another thing entirely."

The larger yard was no more optimistic about the chances of its continuing attempts to win export contracts being successful, and was concentrating instead on the development of "specialised equipment" for the U.K. Continental Shelf, "where there can be some pressure by government on the operator to build in the U.K.". In addition to multi-purpose support vessels (of which the yard already had construction experience), this 'specialised equipment' included the pontoons and columns for tension-leg platforms and steelwork for new designs of semi-submersible and steel gravity platforms. In contrast to the smaller yard's policy, it was also interested in the fabrication of integrated decks and accommodation modules, although it was conceded that it would not be competitive in this area of fabrication. It was hoped that these product developments aimed at the North Sea would help to sustain the yard at full capacity until 1985, with offshore orders contributing approximately 30% of turnover during this period.

The manufacturer of casing and other tubular oilfield products was in a very similar position to the shipyards in that it was uncompetitive in a market which was very price sensitive due to the excess capacity in the industry worldwide. Moreover, it was reluctant to consider widening the sphere of its exporting activities for fear of reprisals :

"We don't touch the Far East, it's the Japanese market.
If we interfere with them they might come over here and
swamp us so we keep off each other's patch."

Consequently, exports of offshore-related equipment over the next 5 years were expected to decline and relief was expressed that at least the domestic market was safe due to the "preferential treatment" afforded this firm by the Gas Council and other customers operating in the U.K. sector of the North Sea.

The pipe-coating yard's turnover is primarily determined by the level of pipeline installation being undertaken. While the U.K. market was considered to be very promising (with the single most significant development being the approval of the gas gathering system), the yard had also, since the first interview, become an exporter (to Gabon and the Middle East) and further exports were anticipated to markets such as India, Italy, Spain and Greece. As a result, the proportion of offshore-related turnover represented by exports was expected to increase beyond its then current level of 10%. Norway and (to a lesser extent) Denmark were expected to develop into major offshore markets, but success in these areas was expected to be dependent upon direct investment to establish local pipe-coating yards. Expansion of the Scottish yard will only be undertaken if it is warranted by contracts secured in advance - for example, if a large share of the gas gathering system is won existing capacity will have to be doubled.

None of the platform fabricators surveyed had exported in the past, nor did any expect to become involved in exporting in the period to 1985. The concrete platform builder had completely closed its west coast yard and, although it was still tendering for U.K. contracts, the platform designs being offered were concrete/steel hybrids which, if ordered, would be constructed at a new east coast site. While one of the steel platform yards was taking steps to extend its capability beyond jackets and decks (and, having already established

a pipe-rolling mill, was in the process of developing a module unit), the other was pinning its hopes on the continuation of orders for platforms, which it expected to become larger, heavier structures with the development of fields in deeper water.¹⁵ Both, however, expected to be fully employed throughout the period fo 1985.

Thus, while both the shipyards and two of the platform yards were optimistically forecasting full capacity for the period to 1985, all five yards admitted that it was unlikely that they would become exporters of offshore-related hardware. Moreover, while the pipe-coating yard expected a gradual increase in offshore-related exports, the much larger tubular steel product manufacturer anticipated a real fall in the volume of offshore-related exports, with the net effect of these changes for the sector as a whole being a reduction in both total sales and exports of offshore-related equipment, as shown in Table 12.5 below.

12.3.3 Modules; Fabrications; Sub-contracting; Metal Goods; Underwater Engineering.

It has already been pointed out that of the two module fabricators which had previously exported offshore-related equipment, one had decided to stop pushing exports and concentrate instead on the development of the domestic market while the other had withdrawn from exporting altogether. These decisions were unaffected by the scenario of impending decline in the domestic market, with both companies indicating their intention to react by extending their range of containerised units for the U.K. sector. Nor did either of the other module fabricators plan to export. While one intended no action in response to the declining domestic market, accepting that this would mean that eventually the yard would either be placed on a 'care and maintenance' basis or closed down altogether, the other argued that its facilities were such that it could (and would) respond by undertaking other forms of offshore-related fabrication and also, more significantly, by diversifying into general and heavy engineering for onshore markets. Thus, none of the module fabricators planned a serious export drive¹⁶ although one yard may continue to have some

15. The possible trend towards the replacement of large structures by subsea completions and 'floating' platforms was not mentioned.

16. Three of the module yards mentioned the significance of transportation costs in reaching their decision to ignore the option of exporting modules.

limited success in exporting containerised units and another was considering the possibility of exploiting its expertise through the establishment of joint-ventures overseas.

Neither of the non-exporting fabricators expected to become involved in exporting because, as one explained :

"Indigenous industry is quite capable of producing the quite basic, unsophisticated technology we produce."

In any case, this firm described itself as "profit-orientated ... less inclined to go for turnover for turnover's sake," and therefore planned to react to the shrinking domestic market firstly by reducing overheads and increasing efficiency and secondly by developing "downstream activities that make use of our existing facilities and labour force and skills", including the onshore maintenance and repair of tanks and vessels and the manufacture of mud silos and more sophisticated pressure vessels such as diving chambers. This firm did not, however, intend to undertake offshore maintenance :

"We're definitely not going to get involved in offshore maintenance because there are problems of mix with onshore labour which is jealous of the rates offered. So you rotate offshore duty, but this leads to problems as some men are not suitable to work offshore; some need close supervision."

The other non-exporter was the largest fabricator surveyed, employing a 'base capability' of 500 local people and contract labour as required up to a peak of 1700. Anticipating the decline in the domestic market and recognising the extremely limited export potential of its expertise in basic fabrication (except through management contracting, for which a separate company had been formed), this firm had already started to upgrade its facilities to enable it to diversify into general engineering, including the manufacture of heavy pressure vessels and tubular steel products. Although the fabrication of other offshore-related items previously not undertaken (including small jackets and modules) was also being considered, diversification into onshore engineering was seen as essential. However, even allowing for some success in this area, this firm was ...

"pretty pessimistic about the future. In 1985 the yard will still be there but I don't know if it will be operational."

TABLE 12.5

Projected Trend in Total Sales and Exports of Offshore-related Equipment (by Sector) 1978-85¹⁷

Sector	1978 ¹⁸						1985					
	Domestic Sales		Exports		Total Sales		Domestic Sales		Exports		Total Sales	
	£m	%	£m	%	£m	%	£m	%	£m	%	£m	%
Shipbuilding & Marine Engineering; Concrete & Steel Platforms; Steel, Pipe & Pipe-coating.	113.1	83.1	13.1	16.9	126.4	100	97.1	90.0	10.8	10.0	107.9	100
Modules; Fabrications; Sub-contracting; Metal Goods; Underwater Engineering.	40.8	95.6	1.9	4.4	42.7	100	22.2	74.2	7.7	25.8	29.9	100
Wellhead & Oilfield Equipment	21.6	45.5	25.9	54.5	47.5	100	37.8	50.7	36.8	49.3	74.6	100
Process Plant	10.4	66.7	5.2	33.3	15.6	100	7.7	55.8	6.1	44.2	13.8	100
Power, Electrical & Electronic Equipment	3.8	77.6	1.1	22.4	4.9	100	3.9	36.1	6.9	63.9	10.8	100
TOTAL	189.9	76.9	47.2	23.1	237.1	100	168.7	71.2	68.3	28.8	237.0	100

SOURCE : Interview data

17. Constant prices.

18. The 1978 statistics relate to the data which was collected during the first phase of the fieldwork carried out in summer 1979.

In contrast, the highly-diversified fabricator was forecasting a major expansion in exports over the next 5 years, particularly to deep-water zones such as Eastern U.S.A., Canada and North-west Australia. However, not content with its deep-water concentration, this company was investing heavily in the development of oilfield products with more universal appeal. As a result of these two strategies turnover was expected to grow in real terms at 20% per annum over the period to 1985.¹⁹ The diving chamber manufacturer also expected a rapid expansion in exports (following the renegotiation of a licensing agreement restricting exports). Finally, although the last fabricator had achieved a modicum of exporting success, disappointment with its export performance had led to a change in strategic emphasis towards a search for new products which could be sold throughout the year as ...

"every year October-February is a low production phase when we are cutting our prices to keep the factory open."

As a result, a manufacturing and marketing licence had already been obtained for a new form of scaffolding system, with the intention being to establish the product in the U.K. offshore market before eventually exporting it to the other sectors of the North Sea and also marketing it to the onshore U.K. civil engineering industry.

Both sub-contractors surveyed had foreseen the decline in offshore construction in the U.K. sector. Indeed, the smaller firm had already concluded that "there's too many oil-related specialists chasing too little work" and therefore had stopped pursuing offshore business in favour of general engineering repair and maintenance. The larger firm, on the other hand, had elected to develop expertise in offshore maintenance and repair :

"There's an awareness that we've got to spread away from construction although our construction has always been miscellaneous construction, we're not specialised in any area. Maintenance is becoming more important and we've established a team and a track record."

Finally, although the studbolt manufacturer planned to extend its product range, the substantial increase in turnover forecasted was

19. None of this growth was attributable to market penetration, that is, the winning of orders at the expense of competitors, which was described as "all very well but very difficult".

largely due to a major export drive, commencing in Norway, Holland and Spain and followed by the development of export markets in Mexico, Eastern Europe and, eventually, the Middle East.

Thus, of the seven firms in this sector which had not previously exported offshore-related equipment only one, the studbolt manufacturer, planned to do so by 1985. Of the remaining non-exporters, one planned a major movement into offshore maintenance and repair, three had selected diversification into general engineering for onshore markets as their principal strategy for survival, one had accepted limited growth as a fact and was concentrating instead on reducing costs as a means of increasing profitability and, finally, one was taking no action whatsoever, having accepted that this might mean that it would not be in existence in 1985. In addition, three of the five firms which had previously exported had decided to concentrate on product development for the U.K. sector rather than export market development (although two of these were likely to continue to export on a limited scale). Interestingly the two fabricators which had selected market development as their major strategy were the manufacturers of the more sophisticated fabrications such as diving bells and helicopter refuelling systems. Hence, although five of the twelve firms in this sector are likely to be exporting offshore-related equipment in 1985, for only three of these - the studbolt manufacturer and the two fabricators of the more sophisticated products - will overseas market development be the major strategy implemented. Not surprisingly, these three firms are largely responsible for the increase in this sector's exports of offshore-related equipment shown in Table 12.5 above. The projected increase in the total sales of offshore-related equipment by these firms will not, however, compensate for the considerable fall in the offshore-related manufactured output of the large fabricator (even assuming it manages to keep its 'base capability' fully employed).

12.3.4 Wellhead & Oilfield Equipment

Although the wellhead equipment supplied to the first North Sea oilfields is already starting to be returned to its original manufacturers for repair and overhaul, the majority of the wellhead manufacturers' turnover in the period to 1985 will be associated with new field developments and, in particular, will depend upon the number of production wells

requiring completion equipment.

Recognising that the ever-increasing repair and overhaul business would not compensate for the decline in new wellhead business in the U.K. sector, one wellhead manufacturer had set its sights firmly on the development of export markets, particularly those in Africa. Indeed, the expansion in exports was expected to be largely responsible for the growth in this plant's turnover - 10% per annum to 1982 and 5% per annum thereafter - forecasted for the period to 1985,²⁰ although some contribution was also anticipated from efforts directed at increasing the firm's share of existing markets. In fact, each of the three wellhead manufacturers surveyed stated that it was aiming to increase its share of the North Sea market. The company most likely to succeed in this objective would appear to be the subsea wellhead manufacturer, which should benefit from the anticipated trend towards subsea completions, and indeed, this firm was expecting "exceptional growth, mainly on the subsea completion side." However, as the North Sea is currently acting as the major test-bed for subsea equipment, exports were not expected to increase their share of total turnover.²¹ To ensure that its technological lead was maintained a 'Special Projects Group' had been established and the importance of continual new product development had been emphasised. The final wellhead manufacturer had been trying hard (but unsuccessfully) to win "that elusive first order" for the subsea completion equipment it had developed for use in the North Sea, but was putting even more emphasis on exporting its standard equipment to South and Central America²² and especially the Middle East. This strategy (together with some increase in market penetration) was expected to result in 20% per annum real growth in the turnover of this firm's Scottish plant.

20. This was despite the fact that direct investment in manufacturing facilities was also being undertaken in Austria (for the Eastern European market), Venezuela and Norway, and consideration was being given to the replacement of warehousing facilities in France by a further manufacturing plant.

21. Nevertheless, this company had identified Norway, West Africa, Australia, Mexico and Brazil as major growth areas, and while direct investment was already being undertaken in Brazil, a partnership in Norway was also under consideration.

22. Where it was hoped that the Scottish plant would become the second supplier to the group's U.S. plant which normally supplied these markets.

As the growth in turnover forecasted by each of these firms was in part based upon increasing market penetration at the expense of competitors, and given that there was already excess production in the U.K. wellhead manufacturing industry, it appears that the growth rates forecasted by one or more of the wellhead manufacturers will prove somewhat optimistic. If accurate, both total sales and exports of offshore-related equipment by these firms would virtually double in real terms by 1985.

The majority of the turnover of the firms in the oilfield equipment sector consisted of down-hole tool sales, which are not directly linked to the volume of field development expenditure. Indeed, one of the large U.S. down-hole tool manufacturers was anticipating a boom in the U.K. sector from 1984 onwards as well-workover activity gets underway. For example, sand problems occurring in the Brent and Statfjord fields will necessitate the replacement of down-hole tools while the utilisation of secondary recovery processes on fields where production levels are falling will also involve changing down-hole tools. Thus, even if development expenditure in the U.K. sector does decline, demand for down-hole tools will be maintained.

The two large U.S. down-hole tool manufacturers surveyed were already supplying virtually every market in the eastern hemisphere. Moreover, at their Scottish plants these manufacturers tended to develop new tools only in response to specific customer problems - since they were already operating at virtually full capacity they were not looking for growth through new product development. For these reasons each was interested primarily in increasing its share of its existing export markets, although neither was forecasting more than 5% per annum real growth in the turnover of its Scottish plant, to be achieved through increased efficiency and very minor increases in capacity. In contrast, the third, smaller U.S. down-hole tool manufacturer surveyed was anticipating a considerable expansion in turnover. While a large part of this would be due to the expected re-allocation of the Middle East markets from the U.S. plant to the Scottish operation, considered even more important was the growth in sales expected to result from the planned expansion of the product line to include the down-hole tools used at the production phase of activity.²³ The two small, Scottish

23. This plant currently specialises in the production of stabilising equipment used during the exploration phase.

down-hole tool manufacturers were adopting completely different strategies. While one intended to concentrate on developing its exports of down-hole tools, the other planned to diversify into general maintenance and repair, particularly for traditional onshore markets. Finally, the traditional U.K. engineering company which had previously failed in its efforts to break into the market for subsea equipment was in the process of making a 'make or break' attempt to become involved right at the start of 'floating' platform developments as a manufacturer of riser tensioning equipment. If successful in winning the first contract (for the Hutton TLP) further orders were expected, both for the North Sea and, eventually, for TLP developments overseas.

Compared with the growth projected by the wellhead manufacturers the real increase expected in both total sales and exports of offshore-related equipment by the oilfield equipment manufacturers was modest. This was principally due to the fact that the two largest companies in this sector had no plans for a major expansion of production capacity in Scotland and were already supplying virtually every offshore market in the world, although it should also be noted that only one of the other firms had selected export market development as its main expansion strategy.

12.3.5 Process Plant

The British manufacturers of pressure vessels and heat exchangers were both far from optimistic about the prospects for their offshore-related business. While one admitted that due to the extent to which overseas markets were protected it could only hope to maintain its current level of offshore-related exports and replace business lost in the North Sea by similar work for the onshore petrochemical industries, the other had decided that there were already too many engineering companies involved in this sector given the size of the market and that therefore it would not make another major effort to break into this market, being content instead simply to pick up sub-contracted steelwork. The latter had also made a conscious decision not to become involved in offshore inspection, maintenance and repair, for the following reasons :

"We would have to give the men platform allowances and so on and once they'd been paid a high salary it would be difficult to get them back to the old environment. It would cause untold industrial disputes and trouble with the wage structure for /

/the sake of 10% of the business. This would lead to an escalation of salaries all round and cause the loss of 90% of our business."

Although also aware of the importance of continuing product development, the Scottish pump manufacturer's main strategy with respect to its offshore-related products was the gradual development of exports, primarily to South America and the Far East (especially Indonesia).

The turnover of the U.S. ball valve manufacturers is fairly closely linked to gas pipeline developments. As far as the U.K. sector is concerned, British Gas appear to have adopted a policy of sharing business between these firms (and a third valve manufacturer situated in England). Both companies expected full capacity to be maintained in the period to 1985, both pointing out that their domestic business represented only a fairly small proportion of their total turnover and that therefore any shortfall resulting from a fall in demand in the U.K. sector of the North Sea could be made good by increasing exports,²⁴ particularly to the Middle East (although one also identified Mexico, West Africa and Canada as other markets offering considerable potential).²⁵

Thus, little change is anticipated in the marketing position of the U.S. valve companies, already heavily involved in the export market, while the only change in the offshore-related turnover of the British process plant manufacturers is likely to be a reduction in sales to the U.K. offshore market. The only company likely to significantly expand its offshore-related exports is the Scottish pump manufacturer which has designed a carefully-planned campaign for the gradual exploitation of certain offshore-related export markets in South America and the Far East. As far as the sector as a whole is concerned, despite a small increase in offshore-related exports, total sales of offshore-related process plant are expected to fall over the period to 1985.²⁶

24. In any case, should demand either exceed or under-utilise the Scottish plant's capacity, business would be transferred between these companies' various plants as required.

25. Although in the case of Canada it was thought likely that direct investment would be necessary.

26. See Table 12.5.

12.3.6 Power, Electrical & Electronic Equipment

Three of the four electronics companies surveyed had not exported equipment to offshore markets overseas in the period for which data was collected. The largest of the non-exporters²⁷ had found that there was very little effective demand for the products it had developed and had therefore decided to move instead into the maintenance of electronic (particularly communications) equipment. On the other hand, the two small Scottish electronics companies did expect to be exporting offshore-related equipment by 1985, although the strategies they intended to employ were somewhat different. One company was largely concentrating on the continuing development of its micro-processor based systems for the U.K. sector and was only planning to export this equipment once it had successfully completed a lengthy proving period in the North Sea and a solution had been found to the problems associated with international marketing - although it had been approached by a larger company willing to market its systems worldwide it was not sure whether this was the correct method of exploiting export markets :

"On a high-technology product I'm not sure if an ordinary company can market it that well. It's not standard, there's got to be so much liaison between the customer and us, even if only 20% of the system has to be changed specifically for the customer."

Despite acknowledging the need to undertake continual product development, the other small company felt, however, that it was rapidly approaching the stage when it could reap the rewards of previous product development by exploiting export markets through agents established overseas. This firm was, in turn, a stage behind the final electronics company which, apart from being heavily committed to further product development, was just commencing a major export drive (through both agents and the worldwide sales and service network of its parent organisation). As the latter remarked :

"For example, we recently developed a new product, a colour video sonar recorder. We're the first with the product, we've got a fantastic lead and we're selling it like mad. It's the classic pattern of North Sea expertise leading to the exploitation of overseas markets."

This company was also planning to exploit the indigenous market for the military, mining and other applications of its subsea electronic equipment.

27. This firm had, however, previously exported offshore-related equipment.

Both power plant manufacturers were planning to increase their exports of offshore-related equipment, but for different motives. One company stated that it was already exporting a high proportion of its turnover and was therefore not too bothered about the decline in the U.K. sector, particularly as it was already planning to actively develop offshore markets in South America and the Far East (including Singapore, Malaysia, Indonesia and perhaps also Australia). The other company was also concentrating on developing offshore markets overseas (including Brazil, Canada and the Persian Gulf), but this was primarily because demand from its other onshore markets was expected to decline even faster than that from the U.K. sector of the North Sea.²⁸

Thus, while two of the three non-exporters in this sector expected to be exporting offshore-related equipment by 1985, the three existing exporters were planning to significantly expand their offshore-related exporting activity. As a result, the volume of offshore-related electrical/electronic equipment exported is expected to increase in real terms over 500% in the period to 1985.²⁹ With little overall expansion in sales of equipment to the U.K. sector, this substantial growth in offshore-related electrical/electronic equipment exports accounts for the vast majority of the increase in this sector's total offshore-related manufactured turnover.

12.3.7 Conclusion

Thus, the firms surveyed proposed to react in a variety of different ways to the scenario, developed and presented by the researcher, of the global offshore market situation in the period 1980-85.

First, it can be seen from Table 12.6 (below), which summarises these reactions, that one firm intended to withdraw from offshore-related manufacturing activity prior to the contraction that would eventually be enforced by the decline in the domestic market. This firm, a platform fabricator, had decided that there was no future for its facilities in Scotland and consequently was closing its yard and selling off its equipment. A further four firms admitted that as there were

28. Direct investment aimed at the offshore market had already been undertaken in the USA and further projects in Mexico, Brazil, Nigeria and the Far East were being considered.

29. As shown in Table 12.5 above.

TABLE 12.6

Expected Strategic Responses of the Sample to the Global
Market Scenario, 1980-85

Strategic response	No. of firms for which this course of action would form part of the strategic response 1980-85	No. of firms for which this course of action would be the major strategic response 1980-85
Overseas market development	23	16
Product development	27	11
Diversification	5	5
Increased efficiency	5	1
Market penetration	4	1
Disinvestment	1	1
Indigenous market development	2	-
No action	4	4

SOURCE : Interview data

very few options open to them they were not planning to take any major action with respect to their offshore-related manufacturing activity. Three of these firms conceded that this policy would result in their offshore-related manufacturing output falling in real terms, but the fourth remained hopeful that turnover and employment would be maintained. Diversification into onshore engineering was expected to form the major strategic response of five firms. However, none of these firms claimed that in moving into onshore markets they would be utilising expertise developed for the offshore market.³⁰ Finally, while one firm which was more interested in profits than sales turnover intended to react by increasing efficiency, cutting costs and hence hopefully improving the profit on an at best constant sales volume, another was planning to take steps to increase its share of the domestic offshore market in an attempt to maintain or even increase its offshore-related sales volume. However, even the managing director of the latter company

30. Two firms did state that they were planning to launch, in indigenous onshore markets, products which they had originally developed for the offshore market, but in neither case was this the main element of corporate strategy.

conceded that there was considerable doubt whether this strategy would ultimately prove successful. Thus, the firms employing one of these five strategies - namely disinvestment, diversification, increased efficiency, market penetration and 'no action' - were very unlikely to increase their offshore-related turnover in real terms in the period to 1985.

Interestingly, only 2 of the 12 firms selecting one of these strategies had any form of offshore-related experience prior to the development of North Sea oilfields (compared with 15 of the 27 firms selecting one of the other strategies) and only 3 of the 12 had exported offshore-related equipment (compared with 21 of the other 27 firms).

Although more firms stated that they would react to the given scenario by undertaking product development than in any other way, for most of these firms product development would not be the major strategy employed. Indeed of the 27 firms which intended to develop new products and/or services for sale to the North Sea market (and, in some cases, eventually also to offshore markets overseas), only 11 expected product development to be their main strategic response in the period to 1985.

It was shown (in Chapter 9) that the nature of the product exerted a strong influence on export performance and export potential. The evidence presented in this chapter suggests that this fact was not only understood by most of the sample but also taken into consideration in the determination of corporate strategy, in that the 16 firms which regarded market development as the main strategy to be implemented with respect to their offshore-related manufacturing business included only 4 of the 19 shipbuilders and fabricators, compared with 12 of the 20 manufacturers of process plant, electrical/electronic and specialised oilfield equipment. That is, considerably fewer firms from the product sectors which have been identified as possessing least export potential - namely shipbuilding and all forms of fabrication - considered that the development of offshore markets overseas should be their major strategy over the next five years than did firms in the other sectors. Furthermore, the firms which had decided to concentrate on the development of the overseas markets for their offshore-related equipment tended to be those which had considerable offshore-related experience, in that the 16 firms opting

for market development included 11 of the 17 firms which had some form of offshore-related experience (either at unit or group level) prior to the exploitation of the North Sea, but only 5 of the 22 firms without any prior offshore-related experience. Finally, 13 of the 16 firms which intended to emphasise the development of offshore markets overseas during the period to 1985 were already exporting offshore-related equipment.³¹ Conversely this means that only three of the firms stressing overseas market development had not already exported offshore-related equipment, although a fourth firm - an electronics firm which had assigned overall priority to product development - also expected to become an exporter of offshore-related equipment for the first time in the period to 1985. Hence, the firms which stated that their main strategic response to the given scenario would be market development were largely experienced offshore-related manufacturers already exporting relatively sophisticated items of offshore equipment.

TABLE 12.7

Expected Strategic Response by Offshore-related
Export Involvement

Major Strategic Response	Offshore-related Export Involvement		Total
	Exporters	Non-Exporters	
Market development	13	3	16
Other strategy	11	12	23
TOTAL	24	15	39

SOURCE : Interview data.

31. See Table 12.7.

Although 24 firms had previously exported offshore-related equipment only 21 of these had done so in the period for which data was collected, and only one of the other three exporters appeared to have any more than a very slight chance of exporting offshore-related equipment again. Moreover, even one of the current exporters had decided to withdraw completely from exporting offshore-related equipment. Given that only four of the surveyed firms expected to export offshore-related equipment for the first time in the time-period covered by the scenario, it seems unlikely that any more than 25 of these 39 firms will be exporting offshore-related equipment in 1985.

The total volume of offshore-related equipment exported by the sample is expected to increase in real terms by 45% over the period to 1985, when it is expected to total almost £70 million.³² Approximately half of this increase in export volume should be accounted for by the wellhead and oilfield equipment sector, although in percentage terms the fastest growth in offshore-related exporting is expected to occur in the electrical/electronic equipment sector. The excellent export potential which this sector is considered to possess is reflected in the fact that it is anticipated that in 1985 over 60% of the offshore-related turnover of the electrical/electronic equipment manufacturers will be accounted for by exports,³³ whereas even in the oilfield equipment and process plant sectors (where most firms surveyed had considerable experience of offshore-related exporting) only 40-50% of offshore-related turnover is expected to be exported.³⁴ With the expansion of exporting activity in the electronics sector at least 17 and perhaps 18 of the firms in the

32. See Table 12.8. However, it should be remembered that several firms did not undertake formal forecasting and planning and therefore some of the projections of total sales and exports of offshore-related equipment in 1985 were only rough estimates. On the other hand, it could be argued that the firms responsible for the vast majority of offshore-related turnover and exports did undertake formal forecasting and planning and that therefore even a considerable margin of error with respect to the small, non-forecasting firms will have little effect on the overall totals.

33. See Table 12.5 above.

34. Although, as Table 12.8 shows, even in 1985 wellhead and oilfield equipment will continue to account for over 50% of the sample's total exports of offshore-related equipment.

TABLE 12.8

Estimated Exports of Offshore-related Equipment 1978-85³⁵

Sector	1978		1985	
	£ million	%	£ million	%
Shipbuilding & Marine Engineering; Concrete & Steel Platforms; Steel, Pipe & Pipe-coating.	13.1	27.8	10.8	15.8
Modules; Fabrications; Sub-contracting; Metal Goods; Underwater Engineering.	1.9	4.0	7.7	11.3
Wellhead & Oilfield Equipment	25.9	54.9	36.8	53.9
Process Plant	5.2	11.0	6.1	8.9
Power, Electrical & Electronic Equipment	1.1	2.3	6.9	10.1
TOTAL	47.2	100.0	68.3	100.0

SOURCE : Interview data

process plant, oilfield and electrical/electronic equipment sectors are expected to be exporting offshore-related equipment by 1985, compared with only 7 of the 19 firms involved in shipbuilding and all forms of fabrication - further evidence of the influence exerted on export potential by the nature of the product.

As far as total sales of offshore-related equipment are concerned, Table 12.5 indicates that the increase (in real terms) in turnover in the wellhead and oilfield equipment sector (and, to a lesser extent, the electrical/electronic equipment sector) should almost exactly compensate for the real reduction anticipated in the offshore-related turnover of the shipbuilders and fabricators. However it should be

35. Constant prices.

noted that some firms in sectors where demand should follow fairly closely the decline in field development expenditure were nevertheless forecasting that they would be able to maintain full capacity. Also, in the wellhead equipment sector, for example, each of the companies surveyed was expecting to increase sales at the expense of its competitors. For these reasons, the estimate of total sales of offshore-related equipment in 1985 may prove somewhat optimistic. Moreover, since several firms commented that they were hoping to increase efficiency, with the result that an increase in turnover may not be accompanied by a proportionate increase in employment, it is anticipated that there will be an overall reduction in employment in offshore-related manufacturing, with the steepest reductions occurring in the shipbuilding and fabrication sectors (which are also, coincidentally, the most labour intensive sectors). On the other hand, it should be remembered that several companies were intending to enter the offshore maintenance and repair business, while others stated that they would be attempting to diversify into onshore markets³⁶ in order to maintain full employment. For these reasons, although offshore-related manufacturing employment will probably fall, total employment and even total offshore-related employment in the surveyed firms may nevertheless be maintained.

36. In some cases, this meant simply reverting to, or expanding, traditional lines of business.

CHAPTER THIRTEEN

CONCLUSION

13.1 INTRODUCTION

In the previous chapters the background, methodology and findings of this study of the export performance of the Scottish manufacturing sector of the offshore supplies industry have been discussed in some detail. The purpose of this final chapter is to draw together the main themes to emerge from the study.

It will be remembered that the main objectives of the thesis were as follows :

- (a) to identify and examine the major factors influencing the export performance of the Scottish manufacturing sector of the offshore supplies industry
- (b) to investigate the likely future development strategies of these companies, and hence probable future trends in the offshore-related exporting activity of this sector of Scottish industry in the period to 1985.

The research methods employed in the achievement of these objectives will be reviewed in the following section. The major findings concerning the factors influencing the export performance of the sample will be examined in Section 13.3, with the implications of these findings for the future of the Scottish manufacturing sector of the offshore supplies industry being discussed in section 13.4. The following two sections will then propose suggestions for policy measures and suggest areas for further research. Finally, this chapter will conclude with a brief summary of the contribution to knowledge made by this thesis.

13.2 RESEARCH METHODOLOGY

The offshore supplies industry proved a difficult area of study. This was not only because it is, on the whole, a relatively new 'industry', concerning which there is a marked absence of data, but also reflected the fact that it is not co-terminous with existing industrial classifications.

The first main phase of fieldwork consisted of an examination of the

factors influencing the export performance of the Scottish manufacturing sector of the offshore supplies industry. This was achieved by means of a series of in-depth, qualitative interviews undertaken with the senior local executives responsible for determining export strategy in 40 manufacturers of offshore-related equipment located in Scotland. Information concerning the identity of the firms constituting the sample population was provided by the O.S.O., S.E.P.D., S.D.A. and Manpower Services Commission. This was supplemented by details of firms drawn from offshore journals (such as Ocean Industry) and offshore registers (such as that produced by the Highlands and Islands Development Board).

The major topics requiring detailed examination in the interview situation were identified during the course of a synthesis of previous research on the determinants of exporting at the level of the firm. This list of topics represented the main areas of discussion covered in each interview, around which a certain degree of flexibility was allowed when advantageous. Whenever possible the topics were allowed to arise naturally in the course of the discussion and no formal questions to be asked in a particular manner at a particular time were devised. The objective of this approach was to remain flexible but stay in control of the interview in order to maximise the collection of relevant data.

The major advantages which this qualitative approach provided over a rigid, quantitative technique involving the use of a structured questionnaire were as follows :-

- (i) Unconstrained by a structured questionnaire, the interview was allowed to follow natural thought channels rather than rigid, predetermined lines. The respondent was free to raise and develop lines of thought which he believed to be relevant. In addition, the interviewer was able to ask supplementary questions where appropriate in order to clarify or probe responses. The ability to probe responses and to approach subjects indirectly provided the researcher with a better opportunity to examine the true motives of behaviour, rather than simple, surface rational-

isations. For example, a reply that 'exporting is not worthwhile' implies that at least this option had received consideration. However, probing could reveal perhaps that in this firm there was no intention to export because its performance in the domestic market was satisfactory (and hence there was no need to export) and that in fact virtually nothing was known about the export markets for its products.

- (ii) When a structured questionnaire is used responses are categorised into predetermined 'slots' designed by the researcher prior to the fieldwork. Since these 'slots' will be based on the researcher's experience, they may not reflect the real range of categorisations held in the market place. Eventually, the researcher will have to impose his own categorisations in order to analyse the interview data. However, this will not occur until the researcher has, in the course of the fieldwork, gained experience of the subject area and of the true motivations influencing the respondents - that is, categorisation is *ex post* rather than *ex ante*.

For these reasons, the qualitative approach resulted in greater depth of information and a better understanding of the real motives for behaviour than would have been possible using a structured interviewing technique. Given that the objective of the study was to examine the motives for behaviour with respect to exporting rather than simply identifying the number of firms which behaved in a particular way, qualitative research was undoubtedly the best method of approach for this study.

However, it is important to bear in mind the implications of the use of a qualitative approach for the results. Firstly, as is normally the case with qualitative research, this study involved the survey of a small number of respondent firms selected on a non-random basis. As a result, the sample was only roughly representative of the various categories of firms within the sample frame. Secondly, a standard interviewing technique was not utilised. Consequently the interview data is not amenable to statistical analysis. Thus, this qualitative study should be regarded as producing 'soft' information and results

which are tentative or indicative in nature.

As regards methodological design two unexpected problems were encountered. Firstly, it was intended to examine the influence which previous exporting experience exerted on managerial attitude to exporting. It was expected that evidence relating to this relationship would emerge from the general discussion of the practice of exporting undertaken in the interviews. However, this did not prove to be the case and hence the nature of this relationship should have been a topic in itself to be raised by means of a direct question where necessary. Secondly, because of the intention to limit the scope of the study to offshore-related manufacturers in Scotland, the size variable used in the thesis was that of the establishment(s) located in Scotland. However, many of the surveyed firms owned facilities outside Scotland and, of course, even if a Scottish subsidiary is small it will have the parent company's resources to fall back on. Therefore, in some cases - for example, as a proxy measure of resources - the size of the enterprise as a whole is the relevant size variable. Nevertheless, although the absence of any data concerning the size of the enterprise did restrict the statistical analysis of the relationship between size and export performance, it did not seriously impair the analysis of the main body of qualitative data.

13.3 MAJOR DETERMINANTS OF EXPORTING SUCCESS

The purpose of this section is to review the main findings concerning the factors influencing the export performance of the surveyed firms. The intention is not to try to summarise all the results but rather to draw together the major themes to emerge from the analysis of both the qualitative and quantitative data collected during the first main phase of the fieldwork.

(i) Nature of the product

The first indication of the relevance of the nature of the product to export performance resulted from the statistical data. This showed clearly that while exports accounted for 23% of the

offshore-related manufactured turnover of the sample as a whole, the firms in the wellhead and oilfield equipment sector exported nearly 55% and the fabricators less than 5% of their offshore-related manufactured sales.

This finding was supported by an abundance of qualitative evidence which also revealed that, in general, a positive relationship existed between product sophistication and export performance and potential. First, it was clear that some of the fabricators had adopted a passive attitude to exporting because they had recognised that it would be extremely difficult, if not impossible, to export the type of basic products they had the capability to produce. In addition, it was noticeable that none of the fabricators claimed a competitive advantage with respect to their fabricated products and, indeed, that it was firms from the fabrication sector which accounted for most of the respondents to admit that they held no comparative advantages over their international competitors. In contrast, all the electrical/electronic equipment manufacturers claimed a product advantage. Finally, in the examination of the exporting problems experienced by the sample, the fabricators and process plant manufacturers commented upon the unsophisticated nature and relative cost of transporting their products and the problems presented by visible trade barriers, while to the manufacturers of electronic and specialised oilfield equipment tariff barriers and transportation costs were relatively unimportant.

Thus, both the quantitative and qualitative evidence indicated that the nature of a firm's products exerted a strong influence on export performance and potential. This evidence is entirely consistent with the findings of Cooper et al (1970) and Tookey (1964) that there is a positive relationship between product sophistication and export potential, and also with the basic supposition underlying the classical theory of international trade that for a firm to be successful in export markets it must possess a comparative advantage over its competitors in those markets.

(ii) Export marketing methods

Analysis of the data relating to the export marketing methods utilised by the 25 offshore-related exporters revealed that there was an association between the export marketing programme implemented and export performance. This result supports the findings of Tookey's (1964) study of export performance in the hosiery and knitwear industry. As regards individual elements of the export marketing mix the following results were obtained :

- (a) Promotion : Most exporters regarded personal selling as the most important method of promoting exports. The features influencing this preference for personal selling were the small number of geographically-concentrated customers in most sectors of the offshore supplies market and the high-value of offshore contracts. However, most exporters used several methods of export promotion, primarily because these were, to a certain extent, seen as performing different functions. For example, while the main sales effort was through personal selling, advertising was used to create and maintain an awareness of the exporter and its capability in customer organisations.
- (b) Distribution : The most effective method of distributing offshore-related equipment overseas was found to be direct to the customer, particularly by means of the establishment of wholly-owned sales and service subsidiaries overseas. Similar findings were made by Tookey (1964).
- (c) Research: Those exporters with an established internal information system were found to be generally more successful in overseas markets than those exporters reliant on external or published information sources. The internal information systems were regarded as providing up-to-date marketing intelligence which external sources could not supply. This underlines the importance of up-to-date export marketing intelligence stressed by Duguid & Jaques (1971) and IMR (1978). It should, however, be noted that

these internal information systems were based upon the exporters' export distribution networks, with overseas offices acting as the main collection points for marketing intelligence from salesmen, agents and other contacts in overseas markets. The results regarding the relevance of exporting intelligence are therefore not independent of those concerning export distribution.

- (d) Product adaptation : Despite being of an industrial nature, most items of offshore-related equipment exported by the sample were either 'one-offs' or products requiring some degree of modification in order to meet the needs of overseas customers. Nevertheless, product adaptation was not generally regarded as a problem. As the survey covered a relatively small number of manufacturers in several product sectors, most of which undertook product modification for export markets, it was not possible to reach general conclusions regarding the significance of product adaptation. In particular, no evidence was found to support the arguments put forward by Keegan (1970), Tookey (1964) and Alexandrides & Moschis (1977) that those firms which adapt their marketing mix for export markets will be more successful exporters.

(iii) Commitment of resources

Considerable evidence was found to support the findings of IMR (1978) and Tookey (1964) that the commitment of adequate resources to exporting is essential. In particular, the kind of export marketing programme identified above as being associated with exporting success requires substantial investment in exporting. For example, a strong association was found between the number of methods of export promotion utilised and exporting success. If the number of methods of export promotion used is taken as a proxy measure of the level of resources committed to export promotion, this result can be interpreted as suggesting an association between the level of export promotion undertaken and export performance. In addition, personal selling - the key export promotional tool - is itself a very expensive activity. For example, several small Scottish firms did not have the means

to employ even one export sales representative. Far more companies were unable to afford the £100,000 currently regarded as the minimum cost of keeping a sales executive and his secretary in an office in, for example, Abu Dhabi. Similarly, distribution methods involving direct contact with overseas markets also require substantial investment (particularly when the establishment of overseas sales and service subsidiaries is involved). Finally, it was only those exporters which had committed the resources to establish a network of permanent sales and service bases overseas which were able to benefit from the utilisation of these networks as channels of communication for the up-to-date marketing intelligence regarded as essential for successful exporting.

(iv) Size of firm

The statistical evidence suggesting that small firms were less successful in export markets was not conclusive. However, substantial qualitative evidence was found to suggest that small firms were at a disadvantage in export markets in that they did not have the necessary resources to undertake successful exporting - this is consistent with the findings of Cooper et al (1970), Kotler (1972), Tookey (1964), P.E.P. (1965), Hirsch (1971), Glejser et al (1980) and Rapp (1976).¹ For example, as explained above, it was found that some small firms could not afford to employ salesmen to undertake direct selling overseas, far less establish a network of sales and service bases overseas. In addition, it should be noted that several firms described their small size as a problem adversely affecting their export performance. Finally, the fact that small firms tended to be involved in a smaller number of export markets than were larger firms provided a further indication that the export-related activities of small firms may be restricted by a lack of resources.

Tookey (1975) argued that firms which do not possess the resources necessary for large-scale exporting may nevertheless achieve

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1. Throughout this study size has been taken as being indicative of the availability of resources. In fact, it is extremely difficult to interpret the significance of size since it may represent a proxy for many possible advantages such as technology and marketing skills, excess managerial capacity, cheap capital, etc.

some exporting success by utilising the export services provided by organisations such as the B.O.T.B. However, the findings of this study suggest that these services were less utilised by small firms than by large and medium-sized firms.² Since one would naturally expect small firms (which are least likely to have the resources to, for example, generate in-house information on overseas markets) to make most use of outside sources of information, this implies that the difference in the export performance of the various sizes of firms may have been the result of more than simply resource availability. On the other hand, it may be that the services provided by the B.O.T.B. are still too costly in resource terms for small firms. For example, one manufacturer commented that participation in a B.O.T.B. trade mission was too expensive, even with the government subsidy.³

Alternatively, small firms can concentrate their limited resources on the effective development of a smaller number of export markets than larger firms (Tookey, 1975, Yarker, 1966, Thomas, 1977). As mentioned above, small firms were indeed found to export to fewer markets than larger firms. Moreover, it was discovered that even some of the larger firms surveyed did not have the resources to market their products throughout the world and that new products were normally launched in a small number of selected markets rather than on a global basis.

(v) Prior offshore-related experience

The quantitative data indicated that there was a clear association between the extent of a firm's offshore-related experience and its export performance. For example, all the firms exporting more than one-third of their offshore-related turnover had offshore-related experience prior to the development of North Sea oil fields. In addition, a strong association was found to exist between prior offshore-related experience and the scope of offshore-related exporting activity, in that none of the firms without any form of prior offshore-related experience was exporting to more than a

2. This supports the conclusions of I.M.R. (1978), see p.96.

3. See p. 241.

dozen overseas markets.

The importance of offshore-related experience was underlined by qualitative evidence. Firstly, the major competitive advantage claimed by the sample as a whole was reputation/track record, while several also claimed to hold an advantage in terms of established contacts or market knowledge. In contrast, several inexperienced firms admitted that breaking down purchasing inertia in overseas markets would be a major problem. In addition, it is clear that it is only those firms which have been involved in the offshore business for a substantial period of time that could be expected to have established an appropriately located network of permanent bases overseas, as the development of such a network is a considerable undertaking which is only possible on a very gradual basis even for a large firm. These bases perform three vital functions. Firstly, they provide a local sales presence in a market in which direct selling is undoubtedly the key method of sales promotion. Second, they offer the fast, reliable, back-up and maintenance services considered so essential by the oil industry. Finally, they act as the main collection points for up-to-date marketing intelligence. Hence, indigenous manufacturers newly-established in the offshore supplies business and without an appropriately located sales and service network are at a serious disadvantage.

(vi) Managerial attitude to exporting

The devotion of adequate resources to exporting does not simply depend upon resource availability but also upon management's attitude to exporting. Strong evidence was found of an association between managerial attitude to exporting and export performance. Several firms had adopted a passive attitude to exporting because they had accepted that their basic products had very little export potential. However, there was evidence in some firms with products of proven export potential of an unwillingness to risk resources in export markets. For example, certain sizeable British companies which had been involved in exporting a sufficient length of time to have established agents in virtually every country in the world had still to establish their first sales office overseas.

(vii) Long-term planning

Consideration was given in Chapter 12 to the proposition that resources may not be committed to exporting unless a firm prepares a plan outlining the export marketing programme and budgeting for the investment likely to be required for the successful implementation of this policy. The key variable influencing the nature of the planning activity undertaken was found to be size of organisation, with small firms in general being less likely to prepare formal plans and forecasts due to their inability to afford specialist staff to undertake the planning function and the inability of their chief executives to free themselves of day-to-day operational problems for sufficient time to consider strategic issues. Further analysis revealed that these 'non-planners' were less successful exporters and that for the sample as a whole there was indeed an association between the formalisation of planning, the commitment of resources to exporting and export performance.

(viii) The dominance of U.S. multinationals

It was evident from the statistical data that the U.S. subsidiaries surveyed tended to export a higher proportion of their total offshore-related turnover than did the rest of the sample. Indeed, 6 of the 7 firms most heavily involved in offshore-related exporting activity were U.S. subsidiaries.

Examination of the qualitative data revealed that all the U.S. subsidiaries had adopted a positive attitude to exporting and that the majority of the firms which stated that they were exporting for the sole reason that they wished to take advantage of global opportunities were U.S. subsidiaries. This evidence would seem to suggest that the superior exporting performance of the U.S. subsidiaries could perhaps, to a significant extent, be attributed to the more aggressive approach which these firms had adopted with respect to export business. However, it should be noted that a number of factors did, in fact, contribute to the exporting success of the U.S. subsidiaries, many of which had nothing to do with nationality per se.

In fact, the difference in the export performance of U.S. and indigenous firms can largely be attributed to three factors which have already been discussed - product-mix, offshore-related experience and size of firm. First, the U.S. multinationals which have established subsidiaries in Scotland have tended to be manufacturers of specialised oilfield equipment, which itself accounted for a large proportion of total offshore-related equipment exports. Second, the U.S. multinationals have considerable offshore-related experience. During their lengthy period of involvement in the offshore market U.S. oil equipment manufacturers have not only established their credibility with the oil companies but have also set up a network of sales and service bases overseas. Finally, the U.S. subsidiaries are part of large organisations which are in a good position to afford the substantial investment required for successful exporting.

Thus, to a considerable extent, the superior performance of U.S. subsidiaries in export markets can be explained by the fact that they are part of large organisations with substantial offshore-related experience manufacturing specialised oilfield equipment. It should also be noted that the best export performance by indigenous firms was achieved by large companies which had been supplying the oil industry (with general mechanical and electrical equipment for use either on or offshore) for many years. Nevertheless, it was also in this sector - where firms had the advantages of size, experience and an exportable product - that evidence was found of indigenous companies failing to make the most of the export opportunities available to them. For example, many experienced oil industry suppliers were still not affording the U.S.A. the attention it deserved in terms of sales effort, given its position as the main centre of purchasing authority for oil-related equipment. Thus, there was evidence that part of the relative lack of exporting success by some British firms may have been attributable to the failure of British business enterprise.

13.4 IMPLICATIONS FOR THE SCOTTISH MANUFACTURING SECTOR OF THE OFFSHORE SUPPLIES INDUSTRY

Of the 60,000-70,000 people in oil-related employment in Scotland in mid-1978, around 20,000 were employed by companies manufacturing equipment for the North Sea and other oil markets. A large proportion of this manufacturing employment was provided by the firms producing the platforms, fabrications and wellhead, power and process equipment required for the development of oil and gas fields in the U.K. sector of the North Sea. However, the oil scenario developed during the course of the second stage of the fieldwork⁴ revealed the U.K. sector of the North Sea to be a gradually maturing oil province in which the number and size of new field developments will decline over time. As a consequence, development expenditure (and hence demand for the items of equipment mentioned above) will fall in real terms over the period to 1985. The anticipated impact of this decline in the U.K. market (together with the expansion in the global offshore market) on the expected corporate strategy of the surveyed firms was examined in the final phase of the fieldwork, for which a qualitative approach was once again adopted. The implications of the results of this and the earlier phases of fieldwork for the future of the Scottish manufacturing sector of the offshore supplies industry will be discussed in this section.

The Scottish shipyards surveyed both conceded that they were unlikely to win export orders. In an industry experiencing considerable excess capacity worldwide, these yards were unable to meet international competition with respect to either price or delivery due to low productivity and the subsidies provided to rival shipbuilding industries. Although these yards stand a good chance of winning their share of orders for offshore-related vessels for the U.K. sector of the North Sea, their view of this market was such that both were looking elsewhere for business in order to achieve the full capacity that they were both optimistically forecasting for the period to 1985. Given that the larger yard has to date failed in its attempts to diversify into various forms of offshore-related fabrication, it appears that

4. This was based on a survey of expert opinion, see pp. 144-148 for further details.

offshore-related output for the U.K. sector of the North Sea may decline, while the export of offshore-related vessels is extremely unlikely.⁵

With certain notable exceptions fabrications, including platforms, are unsophisticated, labour-intensive items and are therefore exactly the type of equipment which overseas governments will ensure are produced locally. They are also expensive and difficult to transport relative to their value. None of the platform fabricators surveyed had exported in the past, nor did they expect to become involved in exporting in the period to 1985. Moreover, although the outlook for the U.K. platform market is not encouraging, attempts to diversify into other areas of fabrication (such as modules) will simply increase pressure in that sector. The sub-contractors and the fabricators of modules and basic steel items have also accepted the extremely limited export potential of their products and none currently has plans to export. Given the decline in domestic demand anticipated the outlook for this sector is bleak, even allowing for the plans of some fabricators to diversify into either offshore repair and maintenance or general engineering for onshore markets. Although the studbolt manufacturer has planned an export drive, the really notable exceptions in this sector were the two manufacturers of the more sophisticated fabrications such as diving bells and helicopter refuelling systems. These firms have selected the development of export markets as their major strategy for the period to 1985, and this should result in an increase in the exports of this sector as a whole. However, this will not compensate for the considerable fall in the offshore-related manufactured output of those fabricators dependent upon the declining U.K. market.

The indigenous firms manufacturing general mechanical engineering equipment (such as tubular steel products, pressure vessels, heat exchangers and pumps) and electrical equipment (such as motors, generators and switchgear) have already achieved some success in export markets.

5. The drilling rig yard was not surveyed during the final phase of interviewing. At the time of the first round of interviewing this yard was owned by a U.S. multinational with facilities in other parts of the world, compared with which the Scottish yard was high-cost. As such, the Scottish yard was normally last in line to win a contract awarded to the U.S. multinational (unless there was a U.K. element to the order) and consequently had experienced considerable difficulty securing orders. However, this

However, these companies are under extreme competition from their U.S., Japanese and European rivals which are also suffering from excess capacity, while in most overseas markets with domestic suppliers these companies face high tariff barriers. Nevertheless, the power plant and pump manufacturers plan to increase exports of offshore-related equipment through the development of selected overseas markets which they feel offer potential for their products. In contrast, the process plant and tubular steel product manufacturers were far less optimistic about their prospects of being able to increase exports to replace declining domestic business. Overall, the anticipated increase in the exports of pumps and electrical equipment is unlikely to be sufficient to offset the reduction in this sector's domestic sales in the period to 1985.

The manufacture in Scotland of specialised oilfield equipment (including wellhead equipment, pipeline ball valves and down-hole tools) is dominated by the subsidiaries of U.S. multinationals already heavily involved in exporting. Despite the fact that U.K. demand was expected to fall in line with the decline in the number of new production wells requiring completion equipment, the U.S. wellhead manufacturers were all forecasting rapid growth in the period to 1985, largely as a result of the expansion of exports (mainly to new markets). However, some of this growth was expected to be at the expense of competitors and hence, although some increase in turnover through exporting is probable, the forecasted growth rates are likely to prove somewhat optimistic. Although the future U.K. demand for pipeline ball valves remains uncertain, domestic business represents a relatively small proportion of the total turnover of the U.S. ball valve manufacturers. Moreover, these companies were confident that any shortfall in demand from the U.K. sector could be made good by increasing exports. In contrast, a boom can be expected in the U.K. demand for down-hole tools from 1984 onwards.⁶ Given that the major U.S. multinationals in this sector were already exporting to virtually every offshore market in the world, growth to 1985 will primarily be based on the U.K. market. Thus, overall, in the period to 1985 a significant increase in both the export and domestic sales of this sector can be expected.

yard was purchased in April 1980 by U.I.E., which has already successfully tendered for 3 drilling rig orders (one of which is for export) as well as fabrication work.

6. This is supported by Department of Energy forecasts of expenditure on well-workovers, see p.26.

However, this specialised oil technology is controlled by U.S. companies and despite the optimism of the U.K. plant managers (particularly those of the wellhead manufacturers) it should be remembered that the scope of the exporting activities undertaken by the U.S. subsidiaries is generally limited in accordance with corporate strategy determined by their parent companies.⁷ In many cases the Scottish subsidiary was the first major manufacturing plant of its type to be located outside the U.S.A. and normally it was allocated the Eastern Hemisphere as its sales territory. However, already several of these companies have established a plant in Singapore and it appears that in time some will set up further manufacturing facilities overseas rather than expand their existing Scottish plant.⁸ Should this direct investment result in increasingly restrictive market allocation policies the growth of the Scottish plants could be seriously constrained. However, although the size of the territory allocated to the Scottish subsidiary may decline, this does not necessarily mean that the size of the market in terms of sales volume will fall. Moreover, geographical market restriction could, for example, be accompanied by new product development or an expansion of the product line manufactured in Scotland. Nevertheless, given the anticipated trend towards increasing restrictions on the scope of the exporting activities of their Scottish subsidiaries, it is somewhat reassuring that most of these multinationals have in the past shown themselves to be willing to transfer contracts to a plant operating seriously below full capacity.

Despite the notable success of certain fabricators of sophisticated items of equipment, the main evidence of the indigenous development of specialised oil-related technology came from the electronics sector. In addition to their product advantage, these Scottish firms have also established a 'track record' with the oil industry through their involvement in the North Sea. That is, North Sea experience has

7. Stuer et al (1973) and Hood & Young (1976) also found considerable evidence of the marketing of US subsidiaries located in Scotland being geographically restricted by their parent companies.

8. For example, the two largest oilfield equipment manufacturers had no plans for a major expansion of production capacity in Scotland in the period to 1985.

provided them with the opportunity to join the 'oil club' which operates worldwide. However, most of these firms still have to prove that they can market their products effectively in export markets. The following quote from the managing director of one small, Scottish electronics firm which has developed an advanced, micro-processor based safety monitoring system indicates that some of these firms may well prove to be inept marketers, lacking the aggression to effectively sell themselves :

"The Scottish Development Agency has projected great expansion plans for us. We're more conservative. We don't know if we want expansion. Providing we can make sufficient profit to support future development we don't have to expand. More people just mean more headaches."

Furthermore, several of these companies are small firms and therefore have to overcome all the exporting problems this creates with respect to overseas sales, distribution and support.

Thus, the total value of offshore-related equipment exported by the sample may increase by up to 40-50% in real terms in the period to 1985. Approximately half of this increase is likely to be accounted for by the U.S. subsidiaries manufacturing specialised oilfield equipment, with the remainder coming from indigenous manufacturers of pumps, power plant, sophisticated fabrications and electronic equipment. However, U.K. demand for platforms, fabrications and process equipment is likely to decline while the export potential of these sectors is also fairly limited. Indeed, as far as total sales of offshore-related equipment are concerned, it is anticipated that the real reduction in the offshore-related turnover of the shipbuilders and fabricators will be slightly greater than the increase in output expected from the oilfield and electronic equipment manufacturers. Consequently, it is anticipated that offshore-related manufacturing employment in the surveyed firms may decline by up to 10% in the period to 1985, with the steepest reductions occurring in the ship-building and fabrication sectors.

13.5 RECOMMENDATIONS AND POLICY IMPLICATIONS

Having drawn together the main themes to emerge from the study and outlined the major implications of these findings for the future of

the Scottish manufacturing sector of the offshore supplies industry, this section is devoted to the discussion of the policy implications of this study.

(i) Expanded role for the Export Section of the Offshore Supplies Office

The Department of Energy's Offshore Supplies Office (O.S.O.) has devoted only a small proportion of its resources to the identification of overseas opportunities. As a result, the Export Section of the O.S.O. has only attempted to provide information concerning major offshore developments overseas, leaving the Export Intelligence Service (E.I.S.) of the British Overseas Trade Board to handle the flow of information concerning smaller contracts. It was therefore surprising to find that the O.S.O. was more heavily utilised by the sample as a source of export marketing intelligence than the E.I.S. In addition, the O.S.O. was less heavily criticised than the E.I.S., over which it holds an important advantage in terms of its detailed knowledge in this specialised industry. Given this evidence, the anticipated decline in the domestic market for many items of offshore-related equipment (together with the expanding global offshore market) and the established importance of up-to-date export marketing intelligence, it would appear that there may be a strong case for an expansion in the O.S.O.'s role as the best supplier of information concerning opportunities for offshore-related manufacturers in overseas markets.

Resources devoted to this end will, however, always be limited. The O.S.O. should therefore consider concentrating on the supply of marketing intelligence to small to medium sized firms, as large firms possessing their own internal communication systems were found to consider the O.S.O.'s intelligence service less useful than did other firms. Indeed, there may be a case for concentrating resources on the identification of opportunities in certain overseas markets and, in particular, certain product sectors where U.K. firms stand their best chance of success.

- (ii) Consistency of government policy with respect to North Sea oil
- The oil companies involved in the development of North Sea oil fields are undertaking extremely heavy, long-term investment in high risk projects. However, the oil industry feels that the treatment which successive governments have afforded North Sea oil development in recent years has created unnecessary additional uncertainty. Although the oil industry has expressed concern about the government's attitude to the award of new acreage and its powers to delay new projects and cut back production from existing fields, the key question appears to relate to taxation. Tax rates were increased twice in 1980 and again in 1981 - in all eight tax changes have taken place since Petroleum Revenue Tax was introduced in 1975. The industry claims that these changes have seriously affected confidence in the ability of the U.K. government to create the stable investment climate necessary for them to commit the substantial sums required for the development of North Sea oil fields. As evidence the oil companies point to the considerable fluctuations in the level of development activity in the U.K. sector of the North Sea while, more recently, several companies appear to have shelved new developments until a more favourable investment climate is secured. Indeed, the last new development sanctioned by the Department of Energy - the Hutton Field - was in August 1980.

To the extent that these arguments are valid, they will be reflected in uncertainty in the domestic market for offshore-related equipment. In the past the fluctuations in the level of development activity have held a particularly severe impact on the platform builders and fabricators, which are heavily reliant on the domestic market. Moreover, uncertainty in the domestic market may also have damaged the export performance of indigenous offshore-related manufacturers. Cooper et al (1970) found that some exporters were unwilling to enter untried markets at a time when an adverse situation existed in the domestic market.⁹ While the arguments put forward in the oil

9. See p. 80.

scenario suggested that a long-term decline in the domestic demand for platforms and their equipment was inevitable, to the extent that government policy with respect to oil may have created additional uncertainty in the domestic market this may have had a detrimental affect on offshore-related export performance. Encouragement of a consistent level of development effort is therefore a factor which should be considered whenever policy measures relating to North Sea oil development are being considered.

(iii) The attraction and integration of foreign multinationals into the U.K. economy

This study has shown that encouraging foreign firms in specialised or high-technology fields to establish subsidiaries in this country can provide long-term employment in areas (such as oilfield equipment) where it would have been very difficult for indigenous firms to break into a market which would otherwise have been served by imports from the U.S.A. and elsewhere. It was shown in Chapter 12 that several of the U.S. subsidiaries have plans for growth in the period to 1985. However, it was also pointed out that the two largest U.S. oilfield equipment manufacturers were not planning to export (having reached the appropriate size to meet the demand emanating from the markets - product and geographical - allocated to them), while several may suffer in the future from increasing restrictions on the scope of their exporting activities. Thus, this evidence suggests that future growth in the employment created by this sector may have to come from the attraction of new subsidiaries rather than through the expansion of existing ones. As Hood & Young (1980) point out, it is therefore vitally important to counteract any adverse perceptions which might exist in the U.S.A. regarding, for example, labour relations in this country. One possible method of achieving this objective is the use in adverts directed at the U.S.A. of the names of well known U.S. companies (such as Baker Oil Tools and Cameron Ironworks) which have established subsidiaries in this country. Alternatively, a list of successful U.S. subsidiaries could be prepared for use as

a promotional tool on sales trips to the U.S.A. (by, for example, S.D.A. personnel), in much the same way as offshore suppliers produce lists of successfully completed offshore-related contracts to vouch for their 'track record' in the industry. Thus the researcher would agree with Hood and Young's (1980) conclusion that it is extremely important to promote new investment from overseas. It is therefore encouraging that the Locate in Scotland organisation has been set up jointly by the S.E.P.D. and S.D.A. to attract inward investment by quality firms in the high technology area.

Having attracted these firms, it is important to ensure that they are permitted to prosper in the long-term. For example, wherever possible joint-venture agreements should not contain clauses prohibiting sales outside the U.K. market. Moreover, it is important that these subsidiaries are encouraged to integrate themselves as much as possible into the local economy in order that the maximum benefit is derived from their presence. A key objective in this area is the relocation of research activity in the U.K. Hood & Young (1976) argue that low R & D intensity is to be expected in new U.S. subsidiaries and that as production facilities grow in maturity in-house R & D is likely to become increasingly necessary. This is supported by the present study which found that very few of the (relatively newly-established) subsidiaries surveyed were undertaking R & D activity in Scotland. Even the development of new products and techniques stimulated by North Sea operations has largely been undertaken in the U.S.A.¹⁰ However, there may be a case for inducing key multinationals to relocate some of their R & D activity in the U.K.¹¹ While technology resulting from research activity relocated in this country would remain under the control of the multinationals, the very fact that the research activity was being undertaken in the U.K. and that U.K. nationals were being employed to carry out this research would

10. Both Lewis et al (1978a) and Baker et al (1978) found that the oil industry tended to depend on established companies for the next generation of equipment - see p. 38.

11. Although how best to encourage the expansion of R & D activity in the Scottish subsidiaries of these firms is a difficult question worthy of detailed research.

facilitate the transfer of technology to indigenous firms. A further consequence of the fairly recent origin of most of the U.S. multinationals surveyed was the fairly narrow range of products generally manufactured at Scottish plants, with the more specialised items of equipment still normally being imported from the U.S.A. Consequently, these firms should be encouraged to extend the range of activities undertaken in this country in order to help safeguard the future of their Scottish plants. Finally, linkages between these subsidiaries and local suppliers should be maximised as increasing contact with these U.S. multinationals may improve the performance of indigenous firms through the transfer of technology, where this is defined in the wider sense to include marketing techniques, production methods, management skills etc. In this respect the O.S.O. in particular may be fulfilling an important role.

13.6 SUGGESTIONS FOR FURTHER RESEARCH

The present study has consisted of a qualitative survey of the exporting policies and practices of a relatively small number of selected firms at a particular point in time. As such, there are two main areas in which further research on the same general theme as the current study would be particularly useful.

- (i) The present study has identified the existence of associations between certain variables - such as the methods of export distribution utilised - and exporting success. However, as Tookey (1964) and Hirsch (1971) have pointed out, it is not strictly possible from the results of a one-off study to establish whether a firm exported more because, for example, it had established a network of sales and service subsidiaries overseas, or whether this network of overseas bases was simply justified at a certain stage of exporting. The direction of this relationship could, however, be discovered were the exporting activities of this firm to be studied on an on-going basis. An on-going study of the exporting activities of the sample could thus yield valuable results. This would be particularly the case for those firms which have products which

appear to possess significant export potential but are as yet at a very early stage in their exporting activities. On a more basic level, it would also, of course, be extremely interesting simply to return to the surveyed firms in 1985 in order to compare actual performance with that planned several years earlier.

- (ii) The limitations of the qualitative approach adopted in this study were discussed in section 13.2 above. In particular it was pointed out that while certain associations were found to exist for the sample as a whole, it is not possible to generalise from these results using statistical analysis. However, given the detailed information concerning the factors influencing the export performance of this sector of industry which has resulted from the present study, it would now be possible to develop a structured postal questionnaire which could be distributed to the entire population of Scottish offshore-related manufacturers. In this way associations indicated by the qualitative analysis could be tested for the population as a whole. Thus, while the postal questionnaire could not provide the same depth of information concerning the practice of exporting in these firms, it would nevertheless produce extremely useful information, particularly when these quantitative findings were viewed in association with the qualitative findings of the present study.

13.7 CONCLUSION

The aim of this thesis was to undertake a thorough study of the practice of exporting in the Scottish manufacturing sector of the offshore supplies industry. In particular, the main objectives were twofold :

- (i) to identify and examine the major factors influencing the export performance of this sector of Scottish industry
- (ii) to investigate likely future trends in the offshore-related exporting activity of these firms in the period to 1985.

These objectives were achieved by means of a series of in-depth, qualitative interviews with the senior executives responsible for determining exporting strategy in forty offshore-related manufacturers.

There are, of course, many topics which have been afforded only the most superficial of treatments. Clearly, little else could be expected from a work of the present proportions. However, this study has made significant contributions in two main areas :

- (i) Prior to this study very little was known about the nature and scale of the exporting being undertaken by offshore-related manufacturers located in Scotland, and virtually nothing about the factors which influence their aims and attainment with respect to exporting. While a certain amount of original statistical evidence concerning the export performance of these firms has been presented, the major contribution of this thesis has been its provision of the first detailed study of the major factors influencing the export performance of this sector of Scottish industry. Moreover, further research was undertaken to investigate the implications of these findings for the future of the Scottish manufacturing sector of the offshore supplies industry in the period to 1985.
- (ii) The qualitative research methodology utilised throughout this study has provided this thesis with an additional element of originality. Studies of export performance in other industries have tended to use structured questionnaires, whether postal or interviewer-administered. This is a very rigid approach which results in interviews following predetermined lines and responses being 'slotted' into preconceived categorisations. Having discovered in the course of his desk research that the attitude of senior management to exporting could be a significant element influencing export performance, the researcher decided that the nature of the research problem required a more flexible approach than those offered by the structured questionnaire. The qualitative technique adopted allowed greater freedom to probe responses and consequently resulted in greater depth of information and better understanding of the real motives for behaviour than would have been possible utilising a more structured approach. Thus, the use of this novel research methodology provided valuable insights into management thinking with respect to exporting in the surveyed firms.

A P P E N D I X 2.1GLOSSARY OF TECHNICAL TERMS USED BY THE OIL INDUSTRY

BIT : The cutting part of the drilling string. The bit can be of several types depending on the rock formations encountered (see drilling string).

BLOW-OUT PREVENTER : A high-pressure valve, usually hydraulically operated, which can be closed by remote control in the event of a build-up of pressure, thereby completely sealing the well.

BUMPER SUB : Telescoping section of drill-pipe (included as part of the drilling string) which compensates for any vertical motion of a floating rig during drilling operations.

CHRISTMAS TREE : An assembly of valves and fittings which is located at the head of the well to control the flow of the oil/gas.

DRILL COLLAR : Length of extra heavy pipe placed above the drilling bit in order to concentrate weight at the bottom of the drilling string (see drilling string).

DRILLING FLUID/MUD : Fluid, often a highly complex mixture of water, clay, chemicals and other additives, used in drilling wells. Fluid is forced by the slush pumps from mud storage tanks via the rotary hose into the hollow 'kelly' and down the centre of the drilling string to the bottom of the well. The fluid is returned via the marine riser to the rig, whereupon the rock-cuttings will be removed (by, for example, passing the mud through a vibrating fine mesh screen) before it is re-circulated.

DRILLING STRING : The drilling string has four main components. At the bottom of the drilling string is the drilling bit. In order to concentrate weight near the bit and prevent the upper part of the drilling string buckling, several lengths of extra-heavy pipe, called drill collars, are placed directly above the bit. Above the drill collars are a number of lengths of drill-pipe which are in turn screwed onto the lower end of the 'kelly'. The 'kelly' is a hollow, 40-foot

long pipe of hexagonal cross-section able to slide through a similarly shaped hole in the rotary table, which is rotated by the main power unit. The kelly transmits the twisting movement from the rotating machinery to the drill-string and thus to the bit. (Rotational drive only is provided to the drill-string as its own weight is sufficient to keep the bit in contact with the rock). As the hole increases in depth, the kelly is gradually lowered until only a short length of it remains above the rotary table, at which time another section of drill-pipe is added to the drilling string just below the kelly once the string has been clamped in the hole.

DRILL PIPE : Steel pipe forming a major element of the drilling string (see drilling string).

DYNAMIC POSITIONING : Method by which drilling vessels can be kept in an exact and stable position over a well involving the use of a complex system of computer-controlled thruster motors which automatically respond to changes in the wind, waves and current.

FISHING TOOLS : Tools lowered into the well on the end of a wireline in order to remove a section of the drilling string which has broken or become stuck.

'KELLY' : Square or hexagonal pipe used to transmit the twisting movement from the rotating machinery to the bit (see drilling string).

MARINE RISER : Tube, running from the blow-out preventer (situated on the seabed) to the rig (on the surface), which excludes the sea from drilling operations and enables drilling fluid to be returned to the rig. The riser has telescopic joints to absorb the heave of the rig and a tensioning system - of tensioners and guidelines - to maintain rigidity for drilling.

ROTARY TABLE : Apparatus rotated by power unit, through which the kelly slides (see drilling string).

SEISMIC SURVEY : Exploration method used to generate marine seismic work profiles, which are basically maps showing the configuration of subsurface rock strata, obtained by recording the speed and arrival time of shock waves (produced by an air gun) reflected from boundaries

between two strata of different density. This system usually requires two vessels - a firing ship and a recording ship - which, with the aid of sophisticated navigational systems, maintain position on set traverse lines along which shooting must take place.

SLUSH PUMPS : Pump used in the circulation of the drilling fluid (see drilling fluid/mud).

WIRELINE : A strong steel wire used to lower tools into a well (see fishing tools).

APPENDIX 2.2

COST BREAKDOWN FOR A HYPOTHETICAL 10,000 FT. WELL, NORTHERN NORTH SEA, mid 1974

ACTIVITY	COST ITEMS	COST (\$'000)	% OF TOTAL
Preparation	Mobilisation/Demobilisation	147	3.9
	Site Preparation	25	0.7
	Transport Rig Move	84	0.9
Drilling Installation Running Costs	Contract Payments	2000	53.1
	Drilling Materials	11	0.3
	Fuel	85	2.3
	Salaries	30	0.8
	Maintenance	23	0.6
Drilling Materials	Mud	154	4.1
	Bits and Coreheads	48	1.3
	Casing	245	6.5
	Cementing	41	1.1
Evaluation	Logging	135	3.6
	Intermediate Testing	15	0.4
	Miscellaneous Evaluation	30	0.8
Transport	Sea	545	14.5
	Air	124	3.3
	Overhead	68	1.8
	TOTAL	3760	100.0

SOURCE : Society of Petroleum Engineers of AIME, Paper No. SPE 5266, "Drilling Costs", by JENKINS, P.B. & CRAWFORD, A.L., 1975. Reproduced in MANSVELT BECK, F.W. & WIIG, K.M., The Economics of Offshore and Gas Supplies, 1977, p.36.

APPENDIX 2.3

APPROXIMATE COST OF DRILLING A TYPICAL EXPLORATION WELL

COST ITEMS	£'000	% OF TOTAL
Site preparation : survey	16	0.7
interpretation	67	2.9
Rig charter : (60 days)	1200	52.4
Rig mobilisation : moving onto station	51	2.2
Consumables : casing, mud, etc.	457	20.0
Specialised services : divers, mud engineers etc.	149	6.5
External services : helicopters, tugs, supply boats, etc.	286	12.5
Abandonment	10	0.4
Sub-Total	2236	97.6
Additional expenses : if oil or gas found	53	2.3
TOTAL	2290	100.0
For each extra day of bad weather	31	1.3

SOURCE : LOVEGROVE, M., Our Island's Oil, 1975, p.29. (Values converted to sterling at an exchange rate of \$1.75 = £1, and reproduced in LEWIS, T.M. & McNICOLL, I.H., North Sea Oil and Scotland's Economic Prospects, 1978, as Appendix 1, p.133).

A P P E N D I X 2.4

COST BREAKDOWN FOR PLATFORM INSTALLATION

COST ITEMS	% OF TOTAL
Temporary work decks (used for platform piling)	3.0
Modify barges	1.5
Derrick barges	45.0
Cargo barges	9.5
Tugs and supply barges	10.5
Diving	7.0
Pile-driving units	2.0
Grouting	0.5
Miscellaneous installation	3.5
Mechanical and electrical hook-up	16.5
N.G.L. installation	0.5
Storage and handling	0.5
TOTAL	100.0

SOURCE : MANSVELT BECK, F.W. & WIIG, K.M., 1977, p.58.

APPENDIX 2.5

EQUIPMENT FOR A TYPICAL NORTH SEA OFFSHORE OIL PRODUCTION PLATFORM

DESCRIPTION	COST (£, 1973 prices)
Substructure	16,000,000
Material for Deck Modules	395,000
Living Quarters and Helicopter Deck	800,000
Gas/Oil Separators and Gas Scrubbers	180,000
Pumps	245,000
Air Compressors, Receivers and Driers	13,500
Boilers and Accessories	12,400
Burner Equipment	6,500
Water and Sewage Treatment Plants	130,000
Tanks	8,000
Mixing Equipment	375
Pipe and Tube	83,000
Valves	148,550
Fittings	20,000
Flanges	23,000
Manifolds	10,100
Hydraulic Pipe Clamps	18,000
Bolting Material	4,100
Gaskets	1,500
Power Generation Units and Electrical Equipment	1,328,000
Power and Control Cable	48,000
Instruments, Meters and Gauges	95,000
Heating and Ventilating Equipment	13,900
Hoisting and Lifting Equipment	137,000
Communication Equipment	4,750
Fire Fighting and Safety Equipment	214,000
Navigational Aids	8,000
Wellhead Equipment (for 10 wells)	165,000
Hydraulic Shut-down Unit	30,000
TOTAL	20,142,875

SOURCE : CROOK, 1975, Appendix 9.

APPENDIX 3.1

Expenditure by Operators and other Production Licensees on Exploration, Development and Operating Activities (£ million)

	1976	1977	1978	1979	1980 ¹
TOTAL EXPLORATION EXPENDITURE	301.4	374.3	261.2	240.8	375.1
TOTAL DEVELOPMENT EXPENDITURE	1880.6	1899.9	1992.2	2043.9	2378.2
Oilfields	1507.1	1555.6	1709.3	1849.3	2170.7
Gasfields	373.5	344.3	282.9	191.2	207.5
TOTAL OPERATING EXPENDITURE	129.8	206.6	345.9	501.8	692.4
Oilfields	81.3	158.9	258.2	409.1	582.0
Gasfields	48.5	47.7	87.7	92.7	110.4
TOTAL EXPENDITURE	2311.8	2481.3	2599.3	2786.5	3445.7

SOURCE : Department of Energy (1981), Appendix 11, pp 45-46.

1. Provisional

Expenditure by Operators and other Production Licensees on Development Activities (Em.)

	1976	1977	1978	1979	1980 ¹
PLATFORM STRUCTURES					
Oilfields	566.4	462.0	264.9	243.6	287.0
Gasfields	144.6	51.6	13.2	2.6	4.7
	711.0	513.6	278.1	246.2	291.7
MODULES & EQUIPMENT					
Oilfields	569.6	691.9	828.0	838.9	950.9
Gasfields	81.8	65.2	50.6	77.5	72.0
	651.4	757.1	878.6	916.4	1022.9
PRODUCTION WELLS					
Oilfields	95.5	155.9	242.5	337.2	415.2
Gasfields ²	22.3	22.6	24.5	17.7	1.8
	117.8	178.5	267.0	354.9	417.0
APPRAISAL WELLS					
	17.7	8.3	12.9	7.4	23.1
OFFSHORE LOADING					
SYSTEMS					
Oilfields	38.6	10.7	14.8	25.7	34.3
Gasfields	-	-	-	-	-
	38.6	10.7	14.8	25.7	34.3
PIPELINES					
Oilfields	141.7	64.8	68.4	99.8	100.5
Gasfields	102.6	178.0	147.4	41.1	38.3
	244.3	242.8	215.8	140.9	138.8
TERMINALS					
Oilfields	71.4	139.9	260.8	278.7	346.8
Gasfields	22.2	26.9	47.2	52.4	90.7
	93.6	166.8	308.0	331.1	437.5
OTHER EXPENDITURE					
Oilfields	6.2	22.1	17.0	21.3	12.9
Gasfields	-	-	-	-	-
	6.2	22.1	17.0	21.3	12.9
TOTAL					
Oilfields	1507.1	1555.6	1709.3	1852.6	2170.7
Gasfields	373.5	344.3	282.9	191.3	207.5
	1880.6	1899.9	1992.2	2043.9	2378.2

SOURCE : Department of Energy (1981), Appendix 11, pp. 45-46.

1. Provisional

2. In the case of gasfields, expenditure on appraisal and production drilling has been combined.

APPENDIX 3.3

Exploration & Appraisal Drilling : 1969-80

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
EXPLORATION DRILLING :												
East of England	34	12	7	8	7	4	2	3	5	-	-	-
East of Scotland	8	10	13	16	18	25	49	25	23	20	22	19
East of Shetland	-	-	4	8	16	26	23	25	24	11	4	7
West of England/Wales	2	-	-	-	1	4	2	4	4	3	-	-
West of Shetland	-	-	-	1	-	8	3	1	11	1	3	6
Channel & SW Approaches	-	-	-	-	-	-	-	-	-	2	4	-
TOTAL EXPLORATION ALL AREAS	44	22	24	33	42	67	79	58	67	37	33	32
APPRAISAL DRILLING :												
East of England	8	2	-	4	6	2	1	1	-	-	-	-
East of Scotland	-	-	4	3	6	7	11	13	20	11	8	13
East of Shetland	-	-	-	1	7	24	24	13	17	8	8	8
West of England/Wales	-	-	-	-	-	-	1	1	1	3	-	-
West of Shetland	-	-	-	-	-	-	-	-	-	3	-	1
Channel & SW Approaches	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL APPRAISAL ALL AREAS	8	2	4	8	19	33	37	28	38	25	16	22
TOTAL EXPLORATION & APPRAISAL WELLS ALL AREAS	52	24	28	41	61	100	116	86	105	62	49	54

SOURCE : Department of Energy (1981), Appendix 6, pp. 35-36.

APPENDIX 3.4

ANALYSIS OF ORDERS PLACED BY OFFSHORE OPERATING COMPANIES 1974-76

	1974			1975			1976		
	Total	UK Share		Total	UK Share		Total	UK Share	
	£m	£m	%	£m	£m	%	£m	£m	%
<u>CAPITAL GOODS</u>									
<u>Fabrications:</u>									
1 Production platforms - concrete	161.0	60.0	37	59.0	29.4	50	25.0	22.0	88
2 Production platforms - steel	87.0	56.0	64	75.0	71.0	95	57.0	40.0	70
3 Modules & other fabrications	187.0	94.0	50	171.0	103.0	60	116.0	62.0	53
<u>Production Plant:</u>									
4 Power generation equipment	22.4	18.5	83	27.0	19.2	71	10.0	8.5	85
5 Pumps	5.8	5.1	88	10.8	8.6	80	5.0	5.0	100
6 Compressors	8.5	3.5	41	3.6	1.5	42	5.0	3.0	60
7 Process plant & equipment	11.9	9.5	80	31.7	28.8	91	18.0	16.0	89
<u>Pipe & Fittings:</u>									
8 Pipe	85.0	6.1	7	58.0	3.0	5	15.0	5.0	33
9 Pipe coating	25.8	23.3	90	1.4	1.4	100	17.0	17.0	100
10 Pipe fittings (Valves & accessories)	18.5	9.0	49	15.4	9.4	61	10.0	7.0	70
11 Casing	26.7	11.7	44	45.0	31.0	69	54.0	46.0	85
<u>Miscellaneous:</u>									
12 Communications equipment	8.0	6.8	85	13.4	11.1	83	12.0	10.0	83
13 Wellhead & completion equipment	8.7	5.3	61	9.5	8.4	88	9.0	5.0	56
14 Safety equipment	3.8	3.6	95	8.2	8.0	98	6.0	5.5	92
15 TOTAL FOR CAPITAL GOODS	660.0	312.0	47	529.0	334.0	63	359.0	252.0	70
<u>SERVICES</u>									
<u>Exploration and Drilling:</u>									
16 Rig hire & production drilling	146.0	37.0	25	159.0	53.0	33	105.0	27.0	26
- rig hire (exploration)				97.0	14.0	15	90.0	19.0	21
- production drilling				62.0	39.0	62	15.0	8.0	55
17 Surveys	14.0	11.0	79	19.7	12.3	62	14.0	9.0	64
18 Drilling tools & equipment	13.3	6.3	47	13.0	6.8	52	13.0	7.0	54
<u>General Services:</u>									
19 Pipe laying	127.0	22.7	18	76.0	8.2	11	100.0	27.0	27
20 Installations operations	123.0	7.7	6	92.0	17.4	19	131.0	45.0	34

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APPENDIX 3.4 (cont'd)

	1974			1975			1976		
	Total	UK Share		Total	UK Share		Total	UK Share	
	£m	£m	%	£m	£m	%	£m	£m	%
21 Diving	7.4	3.1	42	15.6	10.8	69	22.0	13.5	61
22 Helicopter & air services	13.4	8.0	60	23.3	13.8	59	20.0	12.0	60
23 Marine transport	21.2	11.7	55	81.0	33.7	42	56.0	22.5	40
24 Mud logging & well testing	9.7	6.0	62	12.6	3.9	31	8.5	3.5	41
25 Barytes & mud chemicals	6.6	4.2	64	9.6	6.5	68	13.5	9.5	70
26 Cementing services	3.2	1.9	59	6.7	5.7	85	8.0	4.0	50
27 Inspection, testing & maintenance	6.7	4.6	69	14.4	10.0	69	12.0	8.0	67
28 Other services	42.3	28.8	68	62.0	55.0	89	92.0	80.0	87
29 TOTAL FOR SERVICES	534.0	153.0	29	585.0	237.0	41	595.0	268.0	45
30 Design & consultancy	85.0	51.0	60	71.0	42.3	60	87.0	71.0	82
31 GRAND TOTAL	1279.0	516.0	40	1185.0	613.0	52	1041.0	591.0	57

SOURCE : Department of Energy (1977).

APPENDIX 3.5

Analysis of Orders Placed by Sector - 1977/80¹

	1977			1978			1979			1980		
	TOTAL	UK SHARE		TOTAL	UK SHARE		TOTAL	UK SHARE		TOTAL	UK SHARE	
	£m	£m	%	£m	£m	%	£m	£m	%	£m	£m	%
EXPLORATION:-												
A. Surveying	13	9	67	11	8	73	18	14	78	20	13	65
B. Exploration and appraisal drilling	62	16	26	72	14	19	59	17	29	234	73	31
SUB-TOTAL	75	25	33	83	22	27	77	31	40	254	86	34
DEVELOPMENT:-												
C. Production	295	185	63	401	296	74	1116	941	84	711	550	77
D. Installation operations	145	95	66	147	60	41	175	123	70	82	44	54
E. Plant and equipment	151	109	72	132	98	74	162	119	73	232	176	76
F. Submarine pipelines	48	8	16	42	16	38	96	34	35	89	36	40
G. Development drilling	9	3	35	30	21	70	59	41	69	89	51	57
H. Terminals	181	175	96	232	198	85	434	427	98	396	392	99
SUB-TOTAL	829	575	69	984	689	70	2042	1685	83	1599	1249	78
PRODUCTION												
I. Maintenance	56	19	33	73	53	73	146	133	91	81	70	86

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	1977			1978			1979			1980		
	TOTAL		UK SHARE	TOTAL		UK SHARE	TOTAL		UK SHARE	TOTAL		UK SHARE
	£m	£m		£m	£m		£m	£m		£m	£m	
GENERAL SERVICES:- (excluded wherever possible from A-I above)			%			%			%			%
J. Transport (including marine & helicopter)	108	53	50	206	173	84	109	81	74	170	104	61
K. Diving and underwater services	27	13	49	30	23	77	37	23	62	48	26	54
L. Drilling tools and equipment	88	51	57	71	37	52	76	47	62	95	55	58
M. Support of personnel offshore	56	25	44	67	20	30	81	29	36	70	27	39
N. Miscellaneous	56	45	81	60	20	33	111	82	74	63	62	98
SUB-TOTAL	335	187	56	434	273	63	414	262	63	446	274	61
GRAND TOTAL	1295	806	62	1574	1037	66	2679	2111	79	2380	1679	71

SOURCE : 1977 statistics - Department of Energy (1978); 1978 statistics - Department of Energy (1979); 1979 statistics - Department of Energy (1980); 1980 statistics - Department of Energy (1981).

1. In 1977 the Department of Energy altered the way in which the orders placed by the operating companies were analysed, reducing the number of categories provided and regrouping them in order to make each category more self-contained.

A P P E N D I X 4.1

SCOTTISH COMPANIES INVOLVED IN OFFSHORE-RELATED MANUFACTURING AS A PRINCIPAL ACTIVITY

SHIPBUILDING & MARINE ENGINEERING

Ferguson Bros. (Port Glasgow) Ltd., Port Glasgow.
Scott Lithgow Ltd., Port Glasgow.
U.I.E. Shipbuilding (Scotland) Ltd., Clydebank.

CONCRETE & STEEL PLATFORMS

Ayrshire Marine Constructors Ltd., Hunterston
Highland Fabricators Ltd., Nigg Bay.
H.D.N. Offshore Structures, Loch Kishorn.
McAlpine Sea Tank Ltd., Ardyne Point.
McDermott Scotland Ltd., Ardersier.
Redpath de Groot Caledonian Ltd., Methil.

MODULES & OTHER STEEL FABRICATORS

(A) MODULES :

Burntisland Engineers & Fabricators Ltd., Burntisland.
Carronhall Engineering Ltd., Stonehaven.
R.B. Farquhar, Huntly.
Ferguson Sea Cabs Ltd., Inverurie.
Richard Irvin Fabrications Ltd., Aberdeen.
Kestrel Marine Ltd., Dundee.
Motherwell Bridge Offshore, Leith.

(B) MAJOR FABRICATORS :

A.I. Welders Ltd., Inverness.
A.L.I. Construction and Installation Ltd., Aberdeen.
Arbarthorpe Engineering Ltd., Aberdeen.
Bathos Developments Ltd., Stonehaven.
Buchan Express Services Ltd., Aberdeen.
Crombie Fabrications Services (Aberdeen) Ltd., Aberdeen.
Elbar Engineering Ltd., Elgin.
Grampian Containers Ltd., Aberdeen.
Highland Universal Fabrications Ltd., Inverness.
Hunting Oilfield Services (U.K.) Ltd., Aberdeen.
Interweld Ltd., Aberdeen.
Lewis Offshore Ltd., Stornaway.
W. H. Mackay & Sons Ltd., Wick.
New-Mar Oil Services Ltd., Aberdeen.
Oilfield Manufacturing & Services Ltd., Aberdeen.
Peterhead Engineering Co. Ltd., Aberdeen & Dundee.
Robertson & Ferguson Ltd., Fife.
Seawelding (Montrose) Ltd., Montrose
Speyside Engineering Co. Ltd., Elgin.
Standgate Weld-All Ltd., Aberdeen.

(C) GENERAL SUB-CONTRACTORS :

Aberdeen Jig & Tool Co. Ltd., Aberdeen.
 Aberdeen Service Co. (North Sea) Ltd., Aberdeen, Peterhead & Dundee.
 A-I Bit and Tool Company (U.K.) Ltd., Aberdeen.
 Angus Precision Tools Ltd., Arbroath.
 A-Z International Oil Tools Ltd., Aberdeen.
 Belmar Engineering Co. Ltd., Aberdeen.
 Container Care Ltd., Aberdeen.
 Cromarty Firth Engineering Co. Ltd., Evanton.
 D.B.C. Offshore Ltd., Aberdeen.
 E.M.S. Euroweld Ltd., Dundee.
 Forth Tool & Gauge Ltd., Glenrothes.
 Fraser & Ironside Ltd., Muir of Ord, Ross & Cromarty.
 Hydril U.K. Ltd., Aberdeen.
 Kamac Engineering Ltd., Arbroath.
 Mainwork (Maintenance Contracting) Ltd., Aberdeen.
 MacKay & MacLeod Engineering Ltd., Evanton.
 Midlands Shotblasting (Scotland) Ltd., Perth.
 Montrose Offshore Services Ltd., Montrose.
 Mulco (Engineering) Ltd., Aberdeen.
 Nimmo Offshore Services Ltd., Aberdeen.
 Offshore Contractors (Peterhead) Ltd., Peterhead.
 Precision Products (Dundee) Ltd., Dundee.
 ServoOil Ltd. (Engineering & Supplies Division), Aberdeen.
 South Bay Engineering (Peterhead) Ltd., Peterhead.
 Walker Welding Ltd., Aberdeen.
 Wilmar Engineering Services (Aberdeen) Ltd., Aberdeen.
 John Wood Group Engineering Ltd., Aberdeen.

METAL GOODS (not elsewhere specified)

Baldt (U.K.) Ltd., Aberdeen.
 Bruce Anchor Ltd., Edinburgh.
 Channel-Aire Systems Ltd., East Kilbride.
 Fraser & Borthwick Engineering Services Ltd., Irvine.
 Haden Offshore Ltd., Aberdeen.
 Irvent (Metal Products) Ltd., Irvine.
 Norbrit Engineering Ltd., Wishaw.
 Prosper Engineering Ltd., Kilmarnock.
 Rollstud Ltd., Aberdeen.
 Seaward International Inc., Aberdeen.
 Turners of Shettleston Ltd., Glasgow.

STEEL, PIPE & PIPE-COATING

British Pipecoaters Ltd., Leith.
 B.S.C. (Tubes Division), Lanarkshire.
 M.K. Shand Ltd., Invergordon.

OIL TOOLS & WELLHEAD EQUIPMENT(A) WELLHEAD EQUIPMENT :

F.M.C. Corporation Ltd., Dunfermline.
 Gray Tool Co. (Europe) Ltd., Douglas.
 C.E. Vetco Offshore Ltd., Aberdeen.

(B) OILFIELD EQUIPMENT :

Axwell Engineering Ltd., Broxburn.
 Baker Oil Tools (U.K.) Ltd., Aberdeen.
 Black Gold Oil Tools Ltd., Aberdeen.

Brown Bros. & Co. Ltd., Edinburgh.
 Drexel Engineering Services Ltd., Montrose.
 Escol Drilling Equipment Ltd., Dunfermline.
 Halliburton Manufacturing & Services Ltd., Arbroath.
 Intairdril Offshore Services Ltd., Aberdeen.
 Lenmor Production Services Ltd., Aberdeen.
 Leutert (North Sea) Ltd., Aberdeen.
 L.O.R. Oilfield Services Ltd., Aberdeen.
 N.L. Control Systems Ltd., Aberdeen.
 R.G.R. Engineering Products, Aberdeen.
 Sea Oil Services Ltd., Montrose.
 Tri-State Oil Tool (U.K.) Ltd., Aberdeen.

PROCESS PLANT, PUMPS, VALVES & COMPRESSORS

Babcock & Wilcox (Operations) Ltd., Renfrew.
 Henry Balfour & Co. Ltd., Leven.
 Cameron Iron Works, (Ball Valve Division) Ltd., Livingstone.
 Cannon Valves Ltd., Leven.
 A.F. Craig & Co. Ltd., Paisley.
 Largo Lintec Ltd., Buckhaven.
 Motherwell Bridge Engineering Ltd., Motherwell.
 T.K. Valves Ltd., Dunfermline.
 Weir-Pacific Valves Ltd., Glasgow.
 Weir Pumps Ltd., Glasgow.

POWER PLANT

Anderson Strathclyde Ltd., Glasgow.
 Bauteil & Baylor Ltd., Glasgow.
 Parsons Peebles (Motor & Generators) Ltd., Edinburgh.

COMMUNICATIONS, INSTRUMENTATION & OTHER ELECTRICAL EQUIPMENT

Aeranamics Electronics Ltd., Peterhead.
 Banchory Instruments Ltd., Banchory,
 Daniel Industries (U.K.) Ltd., Larbert.
 East Anglian Electronics Ltd., Aberdeen.
 Ferranti Ltd., Edinburgh.
 Glen Instruments (Scotland) Ltd., Alva.
 Moray Electronics Ltd., Elgin.
 Osprey Electronics Ltd., Wick.
 V.U. Data Ltd., Inverness.
 U.D.I. Operations Ltd., Aberdeen.

OTHER MANUFACTURING INDUSTRIES

Aberglen Seamarks Ltd., Aberdeen.
 Angus Sewn-Up Ltd., Forfar.
 Carlyle Wishart & Co. Ltd., Edinburgh.
 Delcoats Ltd., Glasgow.
 Field Gear Ltd., Aberdeen.
 Halket & Adam Ltd., Dundee.
 John Kelly and Son (Kitchen Engineers) Ltd., Aberdeen.
 Lassalle Manufacturing (U.K.) Ltd., Aberdeen.
 Multifabs Ltd., Peterhead.
 Offshore Interiors Ltd., Edinburgh.
 Oilfield Safety Products Ltd., Aberdeen.

P.P.S. Glassfibre Ltd., Inverurie.
Stratoflex (U.K.) Ltd., Glasgow.
Webco Industrial Rubber Ltd., Aberdeen.

UNDERWATER ENGINEERING

Seaforth Maritime Ltd., Aberdeen.
Sub Sea Services Marine Ltd., Aberdeen.

APPENDIX 5.1

EXPORT SERVICES

The British Overseas Trade Board (BOTB) is the wing of the Department of Trade charged with promoting U.K. exports, to which end it was allocated a budget of just over £70 million in the financial year 1978/79. The use of these resources in support of the existing efforts of U.K. firms is analysed in the table below :-

Use of Resources in Export Promotion - 1978/79

	£m
Collection & Dissemination of Market Intelligence	16.9
Trade Promotions, of which	21.9
: overseas trade fairs	16.6
: outward missions	2.8
: other	2.5
Help to Individual Exporters, of which	12.0
: assistance to capital goods export projects	3.3
: assistance to U.K. businessmen visiting overseas and help to exporters in overseas representation	4.5
: market entry guarantee scheme	0.8
: export marketing research & advice	0.9
: other	2.5
Information & Publicity, & Support for Inward Missions, of which	12.3
: overseas information service	8.2
: inward missions & individual business visitors	2.3
: other	2.8
Miscellaneous, including administration & planning	8.3
Total Government Expenditure (including staff costs) in support of the Marketing Operations of Exporters	71.9

SOURCE : British Overseas Trade Board (1979a), p.9.

The strength of the BOTB's operations might be said to lie in the extensive network of contacts that have been established since its

formation in 1972 with a large number of government and commercial bodies both in the U.K. and overseas, particularly its relationship with the U.K.'s diplomatic posts abroad. These provide sales intelligence on overseas markets and act as the main point of contact between local businessmen and visiting U.K. executives. In total there are around 750 full-time commercial counsellors attached to the U.K.'s consulates overseas (BOTB, 1978; Gray, 1979a).

The main government-supported services available to exporters of industrial products will now be discussed in more detail.

Export Intelligence Service (EIS)

The EIS provides subscribing firms with details of specific opportunities abroad and other items of market and economic intelligence important to exporters. The information provided includes :

- (a) enquiries for the purchase of goods or services
- (b) enquiries from potential agents and other firms looking for U.K. partners in joint-venture or licensing agreements
- (c) changes in overseas tariffs and import regulations
- (d) calls for tender
- (e) market reports
- (f) early warnings of major overseas projects.

This information, which is received from 220 Foreign Office posts in 160 countries, is classified and coded

- (a) according to its type in one or more of 17 categories
- (b) by commodity within 7000 commodity headings
- (c) by country and geographical area.

The incoming intelligence is then compared with the profiles of subscribers' interests (which have been coded within the same categories and put on the computer record) to determine the selection of notices to be sent to subscribers (BOTB, 1978).

Trade Fairs and Exhibitions

In 1978 the BOTB supported 303 overseas trade fairs and exhibitions

(Gray, 1979a). The BOTB provides stand space and services at favourable charges to U.K. exporters wishing to assess and develop overseas markets by participating in suitable international trade fairs. Participants at such events outside Western Europe have in the past also been able to claim the cost of the air fares for two representatives manning the stand, as well as assistance with freight charges for equipment exhibited but unsold at the trade fair. However, these fringe benefits will be withdrawn by 1981, except for companies exhibiting overseas for the first time.

Assistance is awarded under three schemes :

- (a) the Joint Venture Scheme : exhibitors taking part under the sponsorship of an approved non-profit-making body (such as a trade association or chamber of commerce) in group displays at suitable international specialised trade fairs (or the relevant section of some general fairs) may be provided with 15 square metres of stand space (Wainwright, 1971).
- (b) British Pavillions : These may be organised to encourage the involvement of U.K. companies at general trade fairs overseas where participation is organised on a national rather than an industry basis.
- (c) British Industrial Exhibitions : These are special all-British trade exhibitions organised in selected markets where no suitable international trade fairs exist (BOTB, 1978). For example, 350 companies were represented on 125 stands at the 10-day British Energy Exhibitions sponsored by the BOTB in Peking in June 1979. In addition to the hundreds of meetings which took place on the stands, more than 800 meetings between the U.K. manufacturers and local trading corporations and ministries were arranged, while more than 60 technical lectures were also delivered.

Outward Missions

The objective of the outward missions scheme is to allow U.K. companies to improve communication with overseas markets and assess the prospects

for exports, and also to reinforce other marketing efforts. For approved outward missions, which should be sponsored by a non-profit-making organisation, the BOTB will contribute financial assistance equal to the cost of sending one representative from each company participating plus a mission secretary or co-ordinator. Usually 6-20 members of a mission will be assisted (Export, June 1979; BOTB, 1978).

In addition, under the Group Export Educational Visits Scheme for Small Firms, the BOTB will provide financial support to approved groups of firms (which have not exported to the country(s) to be visited) towards visits to countries in Western Europe for the purpose of gaining first-hand experience of market conditions.

Capital Goods Projects

The Overseas Project Group of the BOTB co-ordinates government assistance to firms pursuing large overseas contracts. Firms pursuing such contracts may qualify for financial assistance with pre-contractual expenses from the Overseas Project Fund, although these contributions are repayable if a contract is secured.

In 1979 the BOTB published the Smaller Project Management Directory (available free of charge) which is intended to assist small to medium sized companies competing abroad for contracts of under £10 million. The directory gives details of project management companies and consultants which are experienced in negotiating with overseas clients and co-ordinating the activities of sub-contractors and are willing to manage smaller projects. This publication will allow U.K. subcontractors holding information about overseas projects in which they wish to participate to identify and approach a potential project manager who may be interested in leading the bid (Export, July/August, 1979).

Agency Finding Service

This scheme is run by the BOTB with the help of the Commercial Officers based at Foreign Office posts throughout the world and is available to all U.K. companies at a nominal fee. The client is asked to complete a questionnaire which involves description of the company, its operations,

the products and services on offer and the proposed selling arrangements. On the basis of this information the Commercial Officer(s) overseas identify and contact possible agents who meet the firm's criteria and send back a report (containing an analysis of the market prospects for the client firm, together with the names, capabilities and general commercial standing of suitable and interested agents) to the exporter.

Market Entry Guarantee Scheme (MEGS)

MEGS is designed to help small manufacturers deal with the problems and financial risks associated with the penetration and development of a new market. The basis of this scheme is an agreement that the BOTB will contribute 50% of the eligible costs of the market venture in return for a levy on sales receipts in the overseas markets (which is intended to recover the contributions along with a commercial rate of return on the scheme's investment). If sales do not materialise as expected, payment of the levy stops at the end of an agreed period. Eligible costs are defined as those overheads incurred overseas which would otherwise be written off and could only be recouped by the manufacturer through the profit margin on sales, such as office accommodation and warehousing and staff costs (Gray, 1979a; BOTB, 1978).

Export Marketing Research

The BOTB's Marketing Research Section provides free advice on how marketing research can help solve exporting problems; the best methods of conducting research in export markets; suitable consultants/agencies and their costs; and how to set up an in-house marketing research department. Also financial support can be provided towards the cost of marketing research projects, whether carried out by consultants or in-house research staff. Individual companies can claim up to one third of the cost of the research in approved cases, trade associations up to two thirds, and groups of 2 or more firms 50%. Where research is undertaken by in-house staff, allowable costs include overseas travel and subsistence. Priority is, however, given to firms with little or no experience of export market research (BOTB, 1978; Export, September 1979).

Overseas Information Service

The BOTB's Publicity Unit provides advice on the publicity of new products and/or services in export markets and exporters may even be given free publicity if they can offer newsworthy items about their export activities. This material will be passed on to diplomatic posts overseas (BOTB, 1978; Lewando, 1977).

Inward Missions

The BOTB can offer financial assistance to groups of companies wishing to receive in the U.K. a deputation of overseas buyers or influential visitors. The interests of the mission members must be broadly similar and a joint-programme of visits must be undertaken by them. To qualify for assistance the mission must be sponsored by a trade association, chamber of commerce, etc. which must meet some of the cost. The BOTB will, however, provide organisational assistance and generally pay 50% of the price of a direct economy class airfare for mission members from W. Europe (75% of those from elsewhere) as well as 50% of internal travel, hotel accommodation and essential interpretation costs (Export, June 1979; BOTB, 1978).

The Export Credits Guarantee Department (ECGD)

ECGD assists exporters in two main ways :-

- (a) it insures them against the risk of not being paid
- (b) it furnishes unconditional guarantees of 100% repayment to banks, thereby allowing them to provide finance to exporters at favourable interest rates (ECGD, 1977; BOTB, 1978; Deschampsneufs, 1967; Wainwright, 1971).

(a) Insurance for Supplier Credit

The ECGD's insurance business is operated on a commercial basis involving no cost to the taxpayer. ECGD classifies exports into two broad categories. Firstly, cover for trade of a repetitive type is provided on a 'comprehensive' basis, that is, the exporter must cover all (or, in certain circumstances, most) of his export business for a year in all markets. Cover is restricted to 90% of loss from buyer risk (customer default) and 95% of loss from political risks (such as cancellation

of a valid import licence, war, etc.).

The Comprehensive Short Term Guarantee covers sales on credit terms not exceeding six months. However, exporting general engineering equipment frequently requires credit to be extended to the buyer for more than six months. For this reason holders of a Comprehensive Short Term Guarantee policy can cover specific contracts where credit terms of between six months and five years are offered under a separate policy, the Supplemental Extended Terms Guarantee. The standard Comprehensive Short Term Guarantee covers sales from stock held overseas for immediate delivery. In addition, holders of this policy can get ECGD cover for goods while they are in stock prior to sale (against loss arising from war, confiscation etc) through a Supplementary Stocks Guarantee.

The second category of trade consists of projects and large capital goods business of a non-repetitive nature, usually of high value and involving lengthy credit terms. Such business is not suited to comprehensive treatment and specific policies are negotiated for each contract. Under a Specific Guarantee, cover (which is restricted to 90% of the loss) is provided for transactions on credit up to five years. The financing of export transactions covered by specific policies may be facilitated by guarantees given direct to the exporter's bank, as discussed in Section (b) below.

Other insurance cover offered by the ECGD includes :

- (1) the Construction Works Guarantee: for U.K. contractors being employed on a specific construction project overseas.
- (2) the Services Guarantee: providing cover (broadly along the lines of ECGD insurance for sales of goods) for earnings from technical and professional services for overseas clients.
- (3) the Cost Escalation Scheme: providing partial protection against certain U.K. cost increases for U.K. firms with capital goods contracts worth at least £2 million with a manufacturing period of at least 2 years.
- (4) the Foreign Currency Endorsement: under which policy-holders who invoice in foreign currencies can be protected against extra losses through participation in the forward exchange market or

foreign borrowing (undertaken to protect themselves against adverse changes in the exchange rate).

- (5) the Joint and Several Facility: under which the main contractor in multi-discipline contracts (worth a minimum of £50 million and of exceptional national interest) is indemnified against unavoidable cost over-runs incurred for reasons outside the insured contractor's control in connection with insured sub-contractors.
- (6) A performance bond is an assurance to the buyer from an undoubted third party (usually a merchant bank) that he will be compensated if the supplier fails to perform the contract. ECGD provides insurance cover against the unfair calling of performance bonds by overseas clients (and also provides support for the issue of performance bonds by supplying an indemnity to a bank willing to issue a bond).

(b) Guarantees for Credit Financing

In the case of 'supplier credit' the manufacturer sells on deferred payment terms, borrowing from a U.K. bank to finance the period from shipment of the goods until payment is received. Apart from insuring the exporter, the ECGD often also gives, for a small additional premium, a direct guarantee to the bank providing export finance (providing the buyer gives a promissory note or accepts a bill of exchange). The bank can then lend to the exporter against the security of this guarantee at special interest rates: at $\frac{1}{2}\%$ over the base rate for business on upto two years' credit from shipment and at special fixed rates of interest for longer term credit.

The ECGD also guarantees repayment of loans made by U.K. banks direct to an overseas buyer for the purchase of U.K. capital equipment. Finance is provided to the buyer at fixed preferential interest rates for up to 85% of the value of the contract. With 'buyer credit' the exporter receives prompt payment (or perhaps even progress payments prior to delivery) from the U.K. bank which has provided the loan to the overseas buyer who in turn will repay the loan in accordance with the terms of the loan agreement with the bank.

The ECGD now accounts for approximately one-third of all U.K. export insurance, in the year to March 1978 insuring exports worth £12.9 billion (Brown, 1979). Unfortunately, with the exception of a few plant contractors, U.K. companies don't seem to get the best out of the ECGD services (Hughes, 1979a). Tookey (1964) discovered that unfavourable comments about the ECGD's services appeared to stem from difficulty in understanding the complicated regulations associated with the ECGD's policies. More recent complaints have been associated with delays in the processing of the credit applications which exporters must submit before they can pursue an export order if they want ECGD cover. However, Hughes (1979a) argues that faults lie on both sides. The ECGD has failed to market itself properly, to make companies aware of the ways in which they can offer support. For their part, exporters tend to think about financing when negotiations are well advanced or even complete, whereas close liaison with those involved in the financing - the ECGD and the banks - is vitally important.

APPENDIX 7.1

Characteristics of Respondent Companies

Company ¹	Nationality ²	Length of Offshore ³ Involvement	Size ⁴	Offshore-related ⁵ Involvement	Export Performance ⁶	Offshore-related ⁷ Export Performance	Export Markets ⁸	Offshore-related ⁹ Export Markets
Shipbuilding & Marine Engineering: A B C Concrete & Steel Platforms: D E F Modules: G H I J Major Fabricators: K L M N	UK UK F	EN EN N	M L L	- 55 100	25 30 100	- - 100	1 1 1	- - 1
	JV JV JV	N N N	L ₁₀ L ₁₀ M	100 100 100	- - -	- - -	- - -	- - -
	S S S	EN N N	S S M	25 100 100	5 10 -	3 10 -	2 1 -	1 1 -
	S UK F	EN N N	S M L	50 90(100) 100	- 20 -	- 20 -	- 15 -	- 15 -
	S	N	S	45(100)	33	33	11	11

APPENDIX 7.1 cont'd

Company	Nationality	Length of Offshore Involvement	Size	Offshore-related Involvement	Export Performance	Offshore-related Export Performance	Export Markets	Offshore-related Export Markets
General Sub-contractors:	O	EN	S	10	-	-	-	-
	P	EN	M	14 (70)	-	-	-	-
Metal Goods:	UK	N	S	80	-	-	-	-
Steel, Pipe & Pipecoating:	JV	N	M	60	-	-	-	-
R	UK	EP	L	75	35	35	11 w/w	w/w
Wellhead Equipment:	T	N	S	50	75	75	8	8
	U	EP	M	80 (86)	40	40	8	8
	V	N	M	100	30	30	15	15
	F	N	S	50	75	75	8	8
Oilfield Equipment:	W	N	M	38 (40)	80	50	40	20
	X	N	S	100	25	25	4	4
	Y	EN	M	5	70	-	70	-
	Z	N	M	40	90	75	30	30
	A2	N	S	85	5	5	2	2
	B2	N	S	20 (100)	10	10	5	5
	F	N	S	20 (100)	10	10	5	5

APPENDIX 7.1 cont'd

Company	Nationality	Length of Offshore Involvement	Size	Offshore-related Involvement	Export Performance	Offshore-related Export Performance	Export Markets	Offshore-related Export Markets
Process Plant:								
C2	UK	EN	L	2	35	-	20	-
D2	F	EP	M	30	65	65	50	4
E2	S	EN	L	5	25	20	15	3
F2	F	N	M	30	80	33	37	15
G2	S	EN	L	9	55	15	w/w	6
Power Plant:								
H2	S	EP	M	40	60	30	w/w	7
I2	UK	EP	L	15	70	33	w/w	12
Electrical & Electronic Equipment:								
J2	S	N	S	36 (90)	-	-	-	-
K2	UK	EP	L	1 (6)	65	-	w/w	-
L2	S	N	S	25	-	-	-	-
M2	UK	N	S	30 (90)	5	5	12	12
Underwater Engineering:								
N2	S	N	M	17 (70)	6	2	22	2

SOURCE : Interview data.

KEY TO APPENDIX 7.1

1. In some cases the unit surveyed was not the entire firm but a division or subsidiary in which the offshore-related activity of the company was concentrated.
2. All the units surveyed were located in Scotland . The nationality listed indicates the location of ultimate control, that is, where the firm's headquarters is situated. The coding used is as follows:
 - S - Scottish company
 - UK - Corporate headquarters located in England or Wales
 - F - Corporate headquarters located overseas
 - JV - A joint-venture between British company(s) and foreign company(s).
3. The North Sea experience of, for example, the platform yards has shown that often new subsidiaries must prove their capability to the offshore oil industry even though their parent companies may already be established in the business. Therefore the length of offshore involvement indicated in Appendix 7.1 refers to the period of time for which the Scottish unit surveyed (not its parent company) has provided products/services to the offshore oil industry. (Although many of the purchasing and engineering functions and personnel in oil companies/contractors will be common to both on and offshore oil/gas, this study concentrated on the offshore oil industry since
 - (a) the technology and operations associated with on and offshore oil activities are not identical and therefore some of the expertise derived from North Sea experience is specifically offshore-related, and
 - (b) this approach narrowed the scope of the study, which was important from the point of view of managability.)

Coding: N - New unit established in Scotland during the 1970s and therefore having no prior experience of offshore markets elsewhere in the world.

EN - A unit established in Scotland prior to 1970 which had no experience of supplying offshore markets prior to the development of the northern North Sea from 1970 onwards.

EP - An established unit which had supplied equipment to offshore markets prior to 1970.

4. A few companies were unwilling to disclose accurate turnover data (broken down on an offshore/onshore and domestic/export basis), while some firms did not organise their accounting in such a way as to be able to provide accurate data of this type. Hence, these figures were sometimes rough estimates. For this reason employment was used as an indicator of size. The size referred to in Appendix 7.1 is that of the Scottish-based operation rather than the group as a whole.

Coding: S - Not more than 150 employees

M - 151 - 1000 employees

L - Over 1000 employees.

5. Offshore-related involvement refers to the percentage of the Scottish-based unit's turnover which, in the previous 12-month accounting period, was accounted for by offshore-related manufacturing, where this includes related repair work such as machining and welding undertaken at the manufacturer's plant but does not include the manufacture of equipment for onshore terminals, platform yards etc. For those units also involved in the provision of offshore-related services, the figures in brackets refer to the proportion of turnover represented by total offshore oil and gas activities.
6. Export performance was measured in terms of the proportion of the Scottish-based unit's turnover exported, where exports are defined as goods/services exported directly by manufacturers or known to be destined for export through merchants or shipping houses. The proportion of turnover exported was chosen as the measure of export performance because the researcher was primarily interested in whether exports could be increased, although from the firm's point of view profitability would probably be the obvious measure of export performance. In any case, it is difficult to assess the profitability of exports as some firms do not employ costing methods permitting comparisons of the profitability of export and domestic orders to be made, while others are likely to be reluctant to provide details of costs and profits. Moreover, it is not possible to assess the relationship between export performance and overall profitability as too many factors - such as product mix and the percentage of sales

exported - influence profitability to allow any association that might exist to clearly emerge. For example, if only 5% of total sales are exported, domestic sales will exert the major influence on profitability.

7. Offshore-related export performance is the proportion of the Scottish-based unit's offshore-related turnover which is exported. In only 3 cases - units N, W and M2 - did offshore-related exports include a (relatively small) service element. Thus, with these exceptions this listing represents the percentage of total offshore-related turnover accounted for by exports of offshore-related equipment.
8. These figures relate to the number of national markets outside the U.K. to which, in the previous accounting year, these units had exported.
9. This column lists the number of national markets outside the U.K. to which, in the previous accounting year, these units had exported offshore-related equipment.
10. When operational - the yard was closed at the time the fieldwork was undertaken.
11. W/W = world wide - an unspecified number over 40.

APPENDIX 7.2

Sample Profile - Aggregate Data

	Nationality				All Companies
	Scottish	U.K.	Joint-venture	Foreign	
No. of units	16	10	4	10	40
Employment : total number (percentage of total) average number	10,545 (26.4) 659	22,415 (56.1) 2,241	2,012 (5.0) 503	4,965 (12.4) 496	39,937 (100.0) 998
Turnover: total (£m) (percentage of total) average (£m)	171.3 (27.8) 10.7	253.7 (41.2) 25.4	46.5 (7.6) 11.6	144.0 (23.4) 14.4	615.5 (100.0) 15.4
Total offshore-related sales: total (£m) (percentage of total) average (£m)	46.1 (16.9) 2.9	95.1 (34.8) 9.5	44.9 (16.4) 11.2	87.0 (31.9) 8.7	273.1 (100.0) 6.8
Offshore-related sales of manufactures: total (£m) (percentage of total) average (£m)	27.7 (11.2) 1.7	90.3 (36.6) 9.0	44.9 (18.2) 11.2	84.1 (36.4) 8.7	247.0 (100.0) 6.8
Exports: total (£m) (percentage of total) average (£m)	53.3 (21.2) 3.3	106.3 (42.3) 10.6	- - -	91.5 (36.4) 9.1	251.1 (100.0) 6.3

APPENDIX 7.2 cont'd

	Nationality				All Companies
	Scottish	U.K.	Joint-venture	Foreign	
Total offshore-related exports: total (£m) (percentage of total) average (£m)	3.6 (6.1) 0.2	14.8 (25.5) 1.5	- - -	39.7 (68.4) 4.0	58.1 (100.0) 1.5
Offshore-related exports of manufactures: total (£m) (percentage of total) average (£m)	2.9 (5.1) 0.2	14.7 (25.7) 1.5	- - -	39.6 (69.2) 4.0	57.2 (100.0) 1.4

SOURCE : Interview data.



UNIVERSITY OF EDINBURGH

Department of Business Studies

WILLIAM ROBERTSON BUILDING, 50 GEORGE SQUARE, EDINBURGH EH8 9JY.

031-667 1011 ext 6652

Dear

I am undertaking a study of the export potential of the Offshore Supplies Industry, as part of a Ph.D. thesis at the University of Edinburgh funded by the Social Science Research Council. A copy of a letter from Professor Norman Hunt, Head of Department, is enclosed vouchsafing the integrity of the study.

Your business has been selected for inclusion in a sample of Scottish manufacturers supplying equipment to the offshore oil industry for consultation on information essential to the study. Your cooperation would be much appreciated as without it the value of the work may be reduced.

I would desire to visit your company and interview those personnel involved in developing and implementing export strategy, in particular the individual who has prime day-to-day responsibility for export sales management. The discussion topics would include current export performance, your company's export policy and exporting methods utilised. In the event that your company does not export at the present time an interview would nevertheless be appreciated. I would also like to return to your company at some future date to discuss the reaction of company employees to a forecast of future market trends for your product group (which will be developed as a result of consultation with industrialists, academics, government officials etc.).

I must stress that information provided will be treated in the strictest confidence, and the identity of your firm will be protected by anonymity and, where it is deemed necessary, by sufficient aggregation of data. However, subject to these restrictions, and in return for your cooperation, on the completion of the research I will make available to you a report detailing my findings - including the aforementioned forecast - should you wish it.

I will telephone you in a few days' time, hopefully to arrange a meeting with you, when I will be only too willing to answer any questions which you may want to raise concerning the study.

Thanking you in anticipation of any help you may be able to offer me.

Yours,

Paul D. Gregory, B.Com.



UNIVERSITY OF EDINBURGH
Department of Business Studies

WILLIAM ROBERTSON BUILDING, 50 GEORGE SQUARE, EDINBURGH EH8 9JY
from Professor Norman C. Hunt 031-667 1011 ext 6577

19th April, 1979.

This is to introduce MR. PAUL GREGORY, who is a postgraduate research student in this Department.

He is pursuing research on the export performance of Scottish manufacturers involved in North Sea oil as a principal activity.

The University would be very grateful for your cooperation in this important project and commends Mr. Gregory to you as a wholly responsible person.

Professor of Business Studies and
Head of Department.

APPENDIX 7.5TOPICS LIST (Phase 1)A. CLASSIFICATION

1. Name and job title of respondent
2. Experience of respondent
3. Name of firm
4. Principal activity of firm
5. Degree of involvement in the offshore oil industry
6. New firm (set up specifically for the North Sea market) or established firm
7. Scottish-based firm or Scottish subsidiary of a UK/foreign firm
8. Equipment currently supplied by the firm to the North Sea market; and to overseas markets
9. Length of involvement in offshore markets overseas - pre-North Sea
10. Typical size of export orders of oil-related equipment compared with that of home orders for oil-related equipment?

B. MANAGERIAL ATTITUDE TO EXPORTING (OIL-RELATED EQUIPMENT)/EXPORT POLICY IMPLEMENTED

1. EXPORT POLICY :

If exporting oil-related equipment; How would you describe your policy towards exports?

If not exporting oil-related equipment;

(a) Have you tried to export in the past?

(b) Are you considering exporting in the future? If not, why not?

2. EXPORT AIMS :

(a) What percentage of offshore output is exported?

(b) Would you prefer a different proportionate division of sales between export and home markets?

If yes, what division would you prefer? Why? and what action are you taking to try to change your current position?

If no, why do you prefer the current home market/export market mix?

3. REASONS FOR EXPORTING :

- (a) What are they?
- (b) Does the firm have any special competitive advantages?

4. BENEFITS OF EXPORTING :

What are they?

5. PROBLEMS WITH RESPECT TO EXPORTING :

- (a) What problems have you experienced with respect to trying to export your products to offshore markets overseas?
- (b) If exporting; What factors are likely to prevent an increase in exports in the future?

If more than one oil-related product is exported; Do the problems you have mentioned vary for different products?

If not trying to export; What problems would you expect to experience with respect to exporting?

- (c) Could your firm export more if it could produce more?
- (d) If orders were increasing faster than production, how would priority between home and export orders be determined?

6. ACTUAL AND EXPECTED PROFITABILITY OF EXPORTS :

- (a) How would you describe the profitability of exports as compared with home sales? Why is this the case?
- (b) Are export prices, ex-factory, identical to home prices?
If no; What determines export prices?
- (c) How essential are exports for long-term survival?

C. EXPORT STRATEGY IMPLEMENTED

(Answered only by firms with exporting experience)

1. EXPORT MARKET SELECTION :

Do you consciously select export markets?

If no; Why not?

If yes; How do you select export markets?

e.g.

- (a) What factors are taken into consideration?
- (b) Do you concentrate on one market or try to enter as many as possible immediately?

2. WILLINGNESS TO ADAPT MARKETING MIX :

- (a) Have you found it necessary in the past to adapt your products (or other elements of your marketing mix) to suit export markets?
How often, and in what circumstances?
- (b) Is it important to adapt the product (and other elements of the marketing mix) to suit export markets?
Why?
- (c) Under what circumstances would you be prepared to undertake changes in the product (and other elements of the marketing mix) to suit export markets?

3. OVERSEAS SELLING METHODS USED :

- (a) Through which channels are your products exported?
If more than one; Relative importance of each?
If agents are used; What are their rights, responsibilities and remuneration, how are they selected?
- (b) Do you use promotion or advertising of any kind in overseas markets?
If yes; What form of sales promotion, and to what extent?
If no; Why not?

4. INFORMATION SERVICES UTILISED :

- (a) Which export-related sources of information does the firm use?
- (b) Has the firm ever commissioned a professional consultant to undertake market research in foreign countries?
How often, in what circumstances and why?

5. AWARENESS AND USE OF EXPORT SERVICES :

- (a) Which export services does the firm use?
- (b) Are there any other export services of which you are aware?
Why are they not used?

6. ORGANISATION OF THE EXPORTING FUNCTION :

- (a) How is the exporting function organised?
- (b) How many employees are devoted to exporting (compared to home sales)?

- (c) Who has prime day-to-day responsibility for export sales management?

To whom does this person report?

- (d) What proportion of their time do export sales executives and export management spend abroad?

- (e) What training of export staff is undertaken?

WOULD YOU LIKE TO MAKE ANY OTHER COMMENTS?

APPENDIX 7.6

STATISTICAL QUESTIONNAIRE

CONFIDENTIAL

1. Name of firm

2. Please state the year to which subsequent replies refer. Details for the financial year 1977/78 are preferred.

Month Year

From :

To :

3. Size of firm :

(a) Number of employees

(b) Annual turnover

4. Involvement in offshore oil & gas :

(a) Offshore oil & gas related employment

i. manufacturing

ii. total offshore-related

(b) Offshore oil & gas related turnover

i. manufacturing

ii. total offshore-related

5. Principal activity

.....

6. What other activities, if any, does the firm undertake? What percentage of turnover do these activities contribute?

- | | Activity | Percentage of turnover |
|-----|----------|------------------------|
| (a) | | |
| (b) | | |
| (c) | | |
| (d) | | |
- 7.. What percentage of total turnover is exported?
8. What percentage of offshore oil & gas related turnover is exported?
9. What equipment does the firm supply?
- i. to the U.K. sector of the North Sea
 - ii. to other offshore markets; and in what quantities?
-

- | | Items of equipment | U.K. sector of the North Sea
£ | Other Offshore areas
£ |
|-----|--------------------|-----------------------------------|---------------------------|
| (a) | | | |
| (b) | | | |
| (c) | | | |
| (d) | | | |
10. To how many countries are you currently exporting?
- (a) in total
 - (b) offshore oil & gas related equipment
11. With which countries does the firm do most offshore oil & gas related export business?

Country Exports (£)

- (a)
- (b)
- (c)
- (d)

12. Do you expect the percentage of offshore oil & gas related turnover represented by exports to change over the next five years?

- Increase significantly
- Increase slightly
- Remain same
- Decrease slightly
- Decrease significantly

13. How do you expect the geographical scope of your offshore oil & gas related export activities to change over the next five years?

APPENDIX 7.7Organisations Constituting the Panel of Experts

Bank of Scotland (International Division), Edinburgh.

Department of Energy (Offshore Supplies Office), Glasgow.

Ivory & Sime, Edinburgh.

McNeill Pearson Ltd., Edinburgh.

Morgan Guaranty Trust Company of New York, London.

Royal Bank of Scotland, Edinburgh and Aberdeen.

Scottish Development Agency, Aberdeen.

Scottish Economic Planning Department, Edinburgh.

Wood, Mackenzie & Co., Edinburgh.

APPENDIX 7.8

Summary of Scenario

1. GENERAL

- (1) DEMAND FOR OIL WILL GROW AT APPROXIMATELY 1% p.a. 1980-85.
(Compared to 6% p.a. 1963-73 and 1% p.a. 1973-78).

FACTORS - lower economic growth
 - price mechanism eliminating energy waste
 - government policies to reduce energy waste
 - inability to change rapidly Western systems, both technical and societal, which run on oil and natural gas
 - inability to expand alternative energy resources 1980-85.

- (2) THE PROPORTION OF OIL AND GAS PRODUCTION FROM OFFSHORE AREAS WILL GRADUALLY INCREASE 1980-85.

Oil : 15% in 1973; 20% in 1976; 22% in 1979; 25% in 1985
 Gas : 10% in 1973; 17% in 1979; 23% in 1985.

FACTORS - higher oil prices make offshore oil viable
 - desire in many countries to develop indigenous energy resources
 - development of offshore-related technology.

- (3) OFFSHORE EXPENDITURE WILL INCREASE IN REAL TERMS TO £10 BILLION p.a. BY 1985 (from £1.2 billion in 1972; £4 billion in 1977; £6 billion in 1979).

FACTORS - increased level of offshore activity
 - development of more difficult and more expensive fields.

2. THE U.K. CONTINENTAL SHELF

CAPITAL EXPENDITURE ON OFFSHORE ACTIVITIES WILL FALL BY 25% IN REAL TERMS 1980-85, FROM AROUND £2 BILLION IN 1979 TO ABOUT £1.5 BILLION IN 1985.

<u>£ million : 1979 prices</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
Capital expenditure on field developments	2000	2080	1905	1625	1370	1230
Capital expenditure on pipeline projects	-	150	700	950	650	300
TOTAL CAPITAL EXPENDITURE	2000	2230	2605	2575	2020	1530

FACTORS - Capital expenditure is determined by the number and scale of developments being undertaken. (Although expenditure will usually peak in the third or fourth year of a field's development).

(a) Development activity 1980-83 will be limited to the exploitation of (mainly marginal) discoveries already made

- reduction in number and size of finds made in the late 1970's has resulted in shortage of large fields awaiting development in the early 1980's.
- rising oil and gas prices have made previously marginal field developments economical.

Three major developments will get under way in 1980; followed by a steady string of smaller, less expensive developments commencing 1981-83.

(b) Development activity 1984-85 will consist of the exploitation of

- i. already discovered (mainly marginal) fields
- ii. significant finds made 1980-82 - although exploration activity will improve 1980-82, success rate probably will not.

Therefore new development activity not expected to exceed 1981-83 level.

3. GLOBAL OFFSHORE MARKET

THE MAJORITY OF EXPENDITURE ON OFFSHORE-RELATED EQUIPMENT IS LINKED TO NEW OFFSHORE DEVELOPMENTS. THE MAIN AREAS OF OFFSHORE DEVELOPMENT 1980-85 WILL BE :

- (a) NORWAY : Current offshore expenditure of £0.85 billion p.a. likely to be maintained in real terms. Several significant new finds made in 1979. Protected market but British suppliers of specialised equipment have been successful.
- (b) CANADA : Possible development 1983-85 of oil and gas resources found in Beaufort Sea, Arctic Islands and east coast. U.S. offshore supplies industry will probably benefit most.
- (c) U.S.A. : Large market, with activity off all coasts. Indigenous industry can satisfy virtually all the oil industry's requirements.
- (d) MEXICO : Major developments in Gulf of Campeche. In 1978 Pemex spent almost £1 billion on equipment, over 50% of which was imported, mostly from the U.S.A. Current U.K. performance in area poor, even compared to other European countries.
- (e) BRAZIL : Offshore development continuing in Campos Basin. Reliance on foreign technology recognised and prospects good for U.K. firms.
- (f) VENEZUELA : Over £10 billion to be spent on on/offshore oil development in the 1980's. Development of recent gas finds 1982 onwards, and prospects for U.K. firms are good.
- (g) WEST AFRICA : Development continuing off the coasts of Angola/Cabinda, Congo Republic, Nigeria and others.
- (h) ABU DHABI : 1977-83 development of Upper Zakum field will cost around \$4 billion, with further developments possible 1983 onwards, although French (CFP) influence benefitting French

suppliers. Other smaller offshore developments costing over \$1 billion also under way.

- (i) QATAR : Development of major offshore gas find probable, and 'marginal' oilfields possible during 1980-85 period. Offshore gas collection scheme under way.
- (j) AUSTRALIA : Development likely 1980-84 of gas deposits in Rankin Basin, costing £1.4 - 1.7 billion. Further development of Bass Straits fields also likely.
- (k) INDONESIA : Exploration expenditure in 1980 expected to reach \$600 billion. Significant development activity (especially with respect to gas) anticipated 1980-85.
- (l) SOUTH-EAST ASIA : Shell and Exxon continuing development of Malaysia's offshore resources. Significant development also off India, Philippines, Thailand and elsewhere.
- (m) U.S.S.R. : Offshore development planned. Comecon market for offshore equipment 1975-85 was estimated at around £11 billion, of which £4 billion was to be imported. British companies were pressing for entry. Whole situation changed by U.S.S.R. presence in Afghanistan.
- (n) CHINA : Major development work 1983 onwards. U.K. companies well-placed as China will need to import deep-water technology and is known to be impressed by North Sea developments.

CONCLUSION :

U.K. MARKET FOR OFFSHORE-RELATED EQUIPMENT WILL DECLINE 1980-85, WHILE THE GLOBAL OFFSHORE MARKET IN GENERAL EXPANDS.



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Dear

Following our conversation on the telephone I have enclosed for your consideration a brief summary of the global oil scenario I have prepared in order that you may have time to read it through prior to our meeting.

I would like to stress that the prime objective of the meeting is not to obtain your opinion of the content of the scenario, but rather to discuss how your company would react to the market situation presented in the scenario.

Looking forward to our meeting,

Yours sincerely,

Paul D. Gregory, B.Com.

APPENDIX 7.10

TOPICS LIST - (Phase 3)

(A) FILL IN ANY GAPS IN STAGE (1) INFORMATION.

(B) ANTICIPATED STRATEGIC RESPONSE TO GLOBAL OIL SCENARIO PRESENTED :-

- (1) HAVE YOU, OR DO YOU INTEND TO, FORMULATE A DEFINITE STRATEGY IN RELATION TO YOUR OFFSHORE-RELATED MANUFACTURING BUSINESS?

If no;

- (a) Why not?
- (b) Do you intend to take any action as far as your offshore-related manufacturing business is concerned? What action and why?
- (c) How do you expect your involvement in offshore markets overseas to change?

If yes;

- (a) What do you intend to do?
 - Disinvest
 - Increase efficiency - same profit on reduced sales
 - Growth: Market penetration - what form will increased marketing effort take?
 - Growth: Product development - which product areas will be developed?
 - Growth: Diversification - into which new business areas will the company move?
 - Growth: Market development
 - (1) Which offshore markets will be developed?
Why these ones in particular?
 - (2) Which exploitation strategy will be utilised
(e.g. exporting; licensing or direct investment)?
Why this method?
- (b) Why was this course of action selected?

(2) WHAT EFFECT WILL THIS STRATEGY (OR LACK OF STRATEGY) HAVE ON :-

- (a) Total employment and sales
- (b) Offshore-related employment and sales.
 - i. manufacturing
 - ii. total offshore-related

(c) Offshore-related exports

- i. manufacturing
- ii. total offshore-related.

Estimates of these variables in 1985?

(C) EXPORT POTENTIAL OF OFFSHORE-RELATED EQUIPMENT

(1) DRILLING RIGS :-

POOR. Exportable product but high cost yard.

(2) DRILL SHIPS :-

VIRTUALLY NIL. Little demand and high cost yard.

(3) SUPPLY VESSELS :-

NIL - POOR. High cost yards with little chance of exporting basic supply vessels but some prospect with respect to sophisticated support vessels.

(4) PRODUCTION PLATFORMS (CONCRETE AND STEEL) :-

VIRTUALLY NIL.

(5) PRODUCT FABRICATIONS :-

MODERATE OVERALL. Ranging from poor in the case of containerised units etc. to good as far as more sophisticated products such as diving bells are concerned.

(6) BASIC STEEL FABRICATIONS (MODULES, HELIDECKS, FLARE BOOMS ETC) :-

POOR.

(7) GENERAL MECHANICAL ENGINEERING :-

CASING - MODERATE

PROCESS EQUIPMENT - MODERATE

OILFIELD PUMPS - GOOD

OILFIELD VALVES - GOOD.

(8) OILFIELD EQUIPMENT :-

VERY GOOD. Companies involved are U.S. subsidiaries which dominate this sector - which includes wellhead equipment, down-hole tools and other oilfield equipment.

(9) ELECTRICAL & ELECTRONIC ENGINEERING :-

NON OIL-SPECIFIC PRODUCTS :

MOTORS AND GENERATORS - GOOD

SWITCHGEAR - GOOD

COMMUNICATIONS EQUIPMENT - GOOD

TELEMETRY/TELECONTROL SYSTEMS - GOOD

SPECIALISED, UNDERWATER EQUIPMENT :

TV, COMMUNICATIONS, SONAR, SURVEY EQUIPMENT ETC. - VERY GOOD.

A P P E N D I X 9.1

Managerial Attitude to Exporting by Size,
Offshore-related Experience and Nationality of Unit

	Managerial Attitude to Exporting		All Companies
	Positive	Passive	
(A) Number of Employees:			
Up to 150	8	6	14
151 - 1000	13	2	15
Over 1000	10	1	11
(B) Offshore-related Experience:			
Prior Experience	18	0	18
No Experience	13	9	22
(C) Nationality:			
Scottish	8	8	16
Other	23	1	24
All Companies:	31	9	40

SOURCE : Interview data

A P P E N D I X 9.2

Reasons for Exporting

Reasons	Number of Firms Mentioning this reason
To expand sales, of which	27
- to grow	(10)
- to survive/maintain employment	(13)
- to increase profits	(4)
To take advantage of global opportunities	8
To spread risk	8
Personal motivation, of which	6
- prestige	(1)
- patriotic reasons	(6)
To monitor global competition	3
Exporting is more profitable	3
To improve company's reputation	3
Exporting is easier	1
To achieve economies of scale	1
Accident	1

SOURCE : Interview data

A P P E N D I X 9.3

Major Reasons for Exporting by Product Sector

Reasons	Product Sector					TOTAL
	Shipbuilding; Platforms; Steel, Pipe & Pipe-coating	Modules; Fabrications; Sub-Contracting; Metal Goods; Underwater Eng'g	Wellhead & Oilfield Equipment	Process Plant	Power, Electrical & Electronic Equipment	
To expand sales, of which - to grow - to survive - to increase profits To take advantage of global opportunities To spread risk Personal motivation, of which: - prestige - patriotic reasons	(8)	(12)	(9)	(5)	(6)	(40)
	8	8	3	3	5	27
	(1)	(3)	(3)	(0)	(3)	(10)
	(5)	(3)	(0)	(3)	(2)	(13)
	(2)	(2)	(0)	(0)	(0)	(4)
	(0)	2	5	1	0	8
To spread risk	0	2	1	1	4	8
	1	3	0	1	1	6
	(0)	(0)	(0)	(1)	(0)	(1)
	(1)	(3)	(0)	(1)	(1)	(6)

SOURCE : Interview data

A P P E N D I X 9.4

Comparative Advantages Allegedly Held by
Offshore-related Export Involvement

Comparative Advantages	Offshore-related Export Involvement		TOTAL (40)
	Exporters (25)	Non-exporters (15)	
Track record/reputation	14	3	17
Product/expertise	12	4	16
Size of firm	6	4	10
Delivery	6	3	9
Industrial relations	6	2	8
Skilled labour force	5	2	7
Price	4	3	7
Market knowledge/contacts	7	0	7
Location	5	1	6
Credit/finance	1	2	3
Facilities	0	3	3
Marketing orientation	2	0	2
None	2	5	7

SOURCE : Interview data

A P P E N D I X 9.5

Number of Comparative Advantages by Offshore-related
Export Involvement

Export Involvement	Number of Comparative Advantages			TOTAL
	NONE	1 - 2	3 - 7	
Exporters	2	7	16	25
Non-exporters	5	7	3	15
TOTAL	7	14	19	40

SOURCE : Interview data

A P P E N D I X 9.6

Comparative Advantages Allegedly Held by Proportion
of Offshore-related Turnover and Volume of
Offshore-related Equipment Exported

	Number of Comparative Advantages			TOTAL
	Nil	1 - 2	3 - 7	
(A) Proportion of Offshore-related Turnover Exported (%) :				
Nil	6	7	5	18
1 - 33	0	6	9	15
34 - 100	1	1	5	7
(B) Volume of Offshore-related Equipment Exported (£m) :				
Nil	6	7	5	18
Less than £1 million	1	5	8	14
£1 million and over	0	2	6	8
TOTAL	7	14	19	40

SOURCE : Interview data

A P P E N D I X 9.7

Exporting Problems

Problems	Number of Firms Mentioning this Problem
Additional costs & problems of overseas marketing	23
Visible trade barriers	19
Inaccessibility of markets	17
Payment problems	17
Invisible trade barriers	15
Purchasing inertia	13
Prices uncompetitive	12
Export subsidies	9
Size/limited resources	9
Politics	9
Currency fluctuation	8
Productivity	8
Raw material & labour supply	7
Restricted export markets	7
Unsophisticated product	6
Delivery	6
Value of sterling	3
Insufficient government support	3
Credit provision	3
Lower profitability of exports	2
Location	2
None	3

SOURCE : Interview data

A P P E N D I X 9.8

Potential Future Exporting Problems

Problems	Number of Firms Mentioning this Problem
Value of sterling	6
Insufficient government support	1
Visible trade barriers	1
National image	1
Raw material & labour supply	1
Productivity	1
Restricted export markets	1
None	17

SOURCE : Interview data

A P P E N D I X 10.1

The Association between the Export Market Selection Policy
Implemented and the Scope of Offshore-Related Exporting Activity

Market Selection Policy	Number of Offshore-related Export Markets			Total
	1-6	7-12	Over 12	
No selection of export markets	3	1	1	5
Imposed restrictions on export markets	4	2	4	10
Conscious selection of export markets	3	3	1	7
TOTAL	10	6	6	22

SOURCE : Interview data.

A P P E N D I X 10.2

The Association between the Volume of Offshore-Related Exports
and the Scope of Offshore-related Exporting Activity

Volume of Offshore-related Exports	Number of Offshore-related Export Markets			Total
	1-6	7-12	Over 12	
Less than £1 million	8	5	1	14
£1 million and over	2	1	5	8
TOTAL	10	6	6	22

SOURCE : Interview data

A P P E N D I X 10.3

Number of Methods of Promotion Utilised by
Offshore-related Export Performance

Number of Methods of Promotion Utilised	Proportion of Offshore-related Turnover Exported (%)			Total
	0-33	34-66	67-100	
0 - 2	9	0	0	9
3 - 4	9	4	3	16
TOTAL	18	4	3	25

SOURCE : Interview data

A P P E N D I X 10.4

Number of Methods of Promotion Utilised by
Offshore-Related Experience

Number of Methods of Promotion Utilised	Offshore-related Experience		Total
	No Experience	Prior Experience	
0 - 2	6	3	9
3 - 4	4	12	16
TOTAL	10	15	25

SOURCE : Interview data

A P P E N D I X 10.5

Methods of Export Distribution by Offshore-Related
Export Performance

Methods of Distribution	Proportion of Offshore-Related Turnover Exported (%)			Total
	0-33	34-66	67-100	
Indirect	4	0	0	4
Salesmen	7	1	0	8
Salesmen & sales offices overseas	6	1	1	8
Sales offices overseas	1	2	2	5
TOTAL	18	4	3	25

SOURCE : Interview data

A P P E N D I X 10.6

Export Marketing Intelligence Sources Utilised
by Export Performance

Export Marketing Intelligence Sources	Proportion of Offshore-Related Turnover Exported (%)		Total
	0-33	34-100	
Internal information system only	2	5	7
Internal information system in association with published or external sources of information	10	2	12
No internal information system	6	0	6
TOTAL	18	7	25

SOURCE : Interview data

APPENDIX 11.1

World Natural Gas Reserves (1979)

	Billion Cubic Metres	%
NORTH AMERICA:		
USA	5493	7.5
Canada	<u>2421</u>	<u>3.3</u>
Total	7914	10.8
LATIN AMERICA:		
Argentina	430	0.6
Bolivia	153	0.2
Brazil	42	0.1
Chile	71	0.1
Columbia	142	0.2
Ecuador*	113	0.2
Mexico	1671	2.3
Peru	31	neg.
Trinidad & Tobago	227	0.3
Venezuela*	<u>1212</u>	<u>1.7</u>
Total	4092	5.6
ASIA-PACIFIC:		
Australia	878	1.2
Bangladesh	227	0.3
Burma	4	neg.
Brunei	218	0.3
Republic of China (Taiwan)	18	neg.
India	263	0.3
Indonesia*	680	1.0
Japan	17	neg.
Malaysia	481	0.7
New Zealand	170	0.2
Pakistan	447	0.6
Thailand	<u>227</u>	<u>0.3</u>
Total	3630	5.0
WESTERN EUROPE:		
Austria	12	neg.
Denmark	80	0.1
France	178	0.2
Germany, West	180	0.2
Greece	113	0.2
Ireland	28	neg.
Italy	99	0.1
Netherlands	1685	2.3
Norway	665	0.9
Spain	57	0.1
U.K.	708	1.0
Yugoslavia	<u>28</u>	<u>neg.</u>
Total	3833	5.3

	Billion Cubic Metres	%
MIDDLE EAST:		
Abu Dhabi*	538	0.7
Bahrain	255	0.3
Dubai*	42	0.1
Iran*	13875	19.0
Iraq*	779	1.1
Israel	3	neg.
Kuwait*	878	1.2
Neutral Zone*	141	0.2
Oman	57	0.1
Qatar*	1700	2.3
Saudi Arabia*	2640	3.6
Syria	42	0.1
Turkey	<u>14</u>	<u>neg.</u>
Total	20964	28.8
AFRICA:		
Algeria*	3738	5.1
Angola-Cabinda	33	neg.
Congo Republic	62	0.1
Egypt	85	0.1
Gabon*	14	neg.
Libya*	680	0.9
Morocco	1	neg.
Nigeria*	1172	1.6
Tunisia	170	0.2
Zaire	<u>1</u>	<u>neg.</u>
Total	5956	8.2
U.S.S.R.:	25485	35.0
CHINA & other Communist Nations:	991	1.4
TOTAL WORLD	72865	100.0

SOURCE : Based on OIL & GAS JOURNAL, December 31st, 1979, pp. 70-71.

1 cubic foot = 0.028317 cubic metres.

* Denotes OPEC member.

APPENDIX 11.2

World Oil (1979)

	Estimated Proven Reserves (as at 1.1.80)		Production (1979)	
	Millions of barrels	%	Thousands of barrels daily	%
NORTH AMERICA:				
USA	26500	4.1	8650	13.8
Canada	<u>6800</u>	<u>1.1</u>	<u>1480</u>	<u>2.4</u>
Total	33300	5.2	10130	16.2
LATIN AMERICA:				
Argentina	2400	0.4	470	0.8
Barbados	1	neg.	1	neg.
Bolivia	150	neg.	30	neg.
Brasil	1220	0.2	165	0.3
Chile	400	0.1	18	neg.
Columbia	710	0.1	125	0.2
Ecuador*	1100	0.2	220	0.4
Guatemala	16	neg.	2	neg.
Mexico	31250	4.9	1490	2.4
Peru	655	0.1	195	0.3
Trinidad & Tobago	700	0.1	215	0.3
Venezuela*	<u>17870</u>	<u>2.8</u>	<u>2330</u>	<u>3.7</u>
Total	56472	8.8	5261	8.4
ASIA-PACIFIC:				
Australia	2130	0.3	440	0.7
Burma	25	neg.	30	neg.
Brunei	1800	0.3	255	0.4
Republic of China (Taiwan)	10	neg.	5	neg.
India	2600	0.4	240	0.4
Indonesia*	9600	1.5	1600	2.6
Japan	55	neg.	10	neg.
Malaysia	2800	0.4	270	0.4
New Zealand	110	neg.	16	neg.
Pakistan	200	neg.	11	neg.
Philippines	<u>25</u>	<u>neg.</u>	<u>15</u>	<u>neg.</u>
Total	19355	3.0	2892	4.6
WESTERN EUROPE:				
Austria	141	neg.	36	0.1
Denmark	375	0.1	12	neg.
France	56	neg.	20	neg.
Germany, West	480	0.1	95	0.2
Greece	150	neg.	-	-
Italy	645	0.1	33	0.1
Netherlands	60	neg.	25	neg.
Norway	5750	0.9	390	0.6
Spain	150	neg.	15	neg.
U.K.	15400	2.1	1570	2.5
Yugoslavia	<u>275</u>	<u>neg.</u>	<u>70</u>	<u>0.1</u>
Total	23776	3.7	2266	3.6

	Estimated Proven Reserves (as at 1.1.80)		Production (1979)	
	Millions of barrels	%	Thousands of barrels daily	%
MIDDLE EAST:				
Abu Dhabi*	28000	4.4	1450	2.3
Bahrain	240	neg.	50	0.1
Dubai*	1400	0.2	360	0.6
Iran*	58000	9.0	2900	4.6
Iraq*	31000	4.8	3370	5.4
Israel	1	neg.	30	neg.
Kuwait*	65400	10.1	2210	3.5
Neutral Zone*	6260	1.0	560	0.9
Oman	2400	0.4	290	0.5
Qatar*	3760	0.6	480	0.8
Saudi Arabia*	163350	25.5	9250	14.8
Sharjah*	11	neg.	15	neg.
Syria	2000	0.3	165	0.3
Turkey	125	neg.	56	0.1
Total	361947	56.4	21186	33.8
AFRICA:				
Algeria*	8440	1.3	1240	2.0
Angola-Cabinda	1220	0.2	143	0.2
Cameroon	140	neg.	32	0.1
Congo Republic	400	0.1	57	0.1
Egypt	3100	0.5	500	0.8
Gabon*	500	0.1	192	0.3
Ghana	7	neg.	3	neg.
Libya*	23500	3.7	2050	3.3
Morocco	neg.	neg.	neg.	neg.
Nigeria*	17400	2.7	2370	3.8
Tunisia	2250	0.4	105	0.2
Zaire	135	neg.	21	neg.
Total	57072	8.9	6714	10.7
U.S.S.R.:	67000	10.4	11670	18.7
CHINA & other Communist Nations:	23000	3.6	2470	3.9
TOTAL WORLD	641623	100.0	62588	100.0

SOURCE : Based on OIL & GAS JOURNAL, Dec. 31st 1979, pp. 70-71.

* Denotes OPEC member

APPENDIX 11.3

Estimated World Offshore Oil Production (1979)

	Barrels per day	%
NORTH AMERICA:		
USA	1,730,000	12.5
CENTRAL AMERICA & THE WEST INDIES:		
Mexico	265,000	1.9
Trinidad & Tobago	<u>168,358</u>	<u>1.2</u>
Total	433,358	3.1
SOUTH AMERICA:		
Brazil	38,359	0.3
Chile	5,695	neg.
Peru	27,063	0.2
Venezuela	<u>1,862,394</u>	<u>13.5</u>
Total	1,933,511	14.0
WESTERN EUROPE:		
Denmark	12,000	0.1
Italy	13,297	0.1
Norway	367,999	2.7
Spain	13,270	0.1
U.K.	<u>1,494,460</u>	<u>10.8</u>
Total	1,901,026	13.8
AFRICA:		
Angola/Cabinda	99,699	0.7
Cameroon	22,900	0.2
Egypt	426,238	3.1
Gabon	166,183	1.2
Nigeria	406,037	2.9
Tunisia	45,300	0.3
Zaire	<u>20,840</u>	<u>0.2</u>
Total	1,187,197	8.6
MIDDLE EAST:		
Abu Dhabi	585,818	4.2
Dubai	362,734	2.6
Iran	175,973	1.3
Israel	40,000	0.3
Neutral Zone	413,000	3.0
Qatar	250,000	1.8
Saudi Arabia (& Bahrain)	2,828,000	20.5
Sharjah	<u>12,082</u>	<u>0.1</u>
Total	4,667,607	33.8

	Barrels per day	%
SOUTH EAST ASIA & AUSTRALASIA:		
Australia	386,532	2.8
Brunei	216,398	1.6
India	100,000	0.7
Indonesia	544,386	3.9
Japan	1,761	neg.
Malaysia	271,033	2.0
New Zealand	2,938	neg.
Philippines	<u>40,000</u>	<u>0.3</u>
Total	1,563,048	11.3
COMMUNIST NATIONS:		
USSR	200,000	1.45
China	<u>200,000</u>	<u>1.45</u>
Total	400,000	2.9
TOTAL WORLD:	13,815,747	100.0

SOURCE : Apart from the exceptions listed below, Appendix 11.3 is based on the country by country survey of world oil fields in the Oil & Gas Journal, 31.12.79, pp. 79-122, and shows average production rates over the first 6 months of 1979.

U.S.A.: estimate - 20% (see Dafter 1978b) of total oil production in 1979.

Mexico: offshore production as at January 1980.

Venezuela: estimate - oil production from Lake Maracaibo (treated as offshore) accounts for roughly 80% of total Venezuelan oil production.

Israel: includes Israeli-occupied portion of Gulf of Suez.

India & Philippines: As at December 1979 (Oil & Gas Journal, 31.12.79, p.73).

USSR & China: best estimate of total offshore oil production in 1979 given available information.

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